Permits

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

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RCRA PERMITS PROGRAM

CLASS 3 COMPLIANCE PLAN MODIFICATION
TO
COMPLIANCE PLAN NO. 50112
PASADENA REFINING SYSTEM INCORPORATED – PASADENA TX

The Texas Commission on Environmental Quality has reviewed the permit application for consistency with the goals and policies of the Texas Coastal Management Program (CMP) in accordance with the regulations of the Coastal Coordination Council and has determined that the permit is consistent with the applicable CMP goals and policies. [30 TAC 281.43(a)(1)]

Compliance Plan No. 50112 is hereby modified as follows:

Replace the current Compliance Plan with the attached revised Compliance Plan.

This Class 3 modification is part of Compliance Plan No. 50112 and should be attached thereto.

Issued Date: MAR 12 2008

For the Commission

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

CLASS 3 PERMIT MODIFICATION
TO
HAZARDOUS WASTE PERMIT NO. 50112
PASADENA REFINING SYSTEM INCORPORATED – PASADENA TX

The Texas Commission on Environmental Quality has reviewed the permit application for consistency with the goals and policies of the Texas Coastal Management Program (CMP) in accordance with the regulations of the Coastal Coordination Council and has determined that the permit is consistent with the applicable CMP goals and policies. [30 TAC 281.43(a)(1)]

Permit No. 50112 is hereby modified as follows:

General

Remove all references to Texas Natural Resource Conservation Commission (TNRCC) and replace with Texas Commission on Environmental Quality (TCEQ) throughout permit.

Continuation Sheets 2 and 3 of 33

Table of Contents

Replace the current Table of Contents with the attached revised Table of Contents.

Continuation Sheet 5 of 33

Provision J.B. Incorporated Application Materials

This section is revised to read as follows: This permit is based on the permit renewal application dated May 7, 1998 and revised October 22, 1998, May 12, 2000, September 18, 2000, February 28, 2001, and June 15, 2001; Class 1[1] modification dated April 20, 2004; Class 1[1] modification changing ownership and name dated February 23, 2005 and revised March 28, 2005; and Class 3 modification transferring the moat from detection monitoring to compliance monitoring dated February 9, 2007, and revised March 21, 2007, June 19, 2007, and June 28, 2007. The permittee shall follow the Part A and Part B Industrial and Hazardous Waste Application elements listed in Attachment C, which are hereby approved subject to the terms of this permit and any other orders of the TCEQ. These materials are incorporated into this permit by reference as if fully set out herein. Any and all revisions to these elements shall become conditions for this permit upon the date of approval by the Commission.

Continuation Sheet 11 of 33

Provision II.B.10. Annual Detection Monitoring Report

This Provision title is revised to read as follows:

10. Annual Detection Monitoring Report – (Not Applicable)

Continuation Sheet 17 of 33

Provision VI. Groundwater Detection Monitoring

This Provision title is revised to read as follows:

PERMIT SECTION VI. – GROUNDWATER DETECTION MONITORING – (Not Applicable)

Continuation Sheet 29 of 33

Provision VII.B.1. Financial Assurance for Closure

This provision is revised to read as follows: The permittee shall provide financial assurance for closure of all existing permitted units covered by this permit in a amount not less than $1,174,000.00 (2007 dollars) as shown on Table VII.E.1. – Permitted Unit Closure Cost Summary. Financial assurance shall be secured and maintained in compliance with 30 TAC Chapter 37, Subchapter P; and 335.152. Financial assurance is subject to the following:

Continuation Sheet 31 of 33

Provision VII.H.1. Financial Assurance for Post-Closure

This provision is revised to read as follows: The permittee shall provide financial assurance for post-closure care of all existing units required by this permit in an amount not less than $652,650.00 (2007 dollars) as shown on Table VII.E.2. – Permitted Unit Post-Closure Cost Summary. Financial assurance shall be secured and maintained in compliance with 30 TAC Chapter 37, Subchapter P; and 335.152.

Table VI.B.3.b. Unit Groundwater Detection Monitoring System

Remove Table VI.B.3.b. – Unit Groundwater Detection Monitoring System from the permit.

Table VI.B.3.c. Groundwater Sample Analysis

Remove Table VI.B.3.c. – Groundwater Sample Analysis from the permit.

Table VII.E. Closure/Post-closure Cost Summary

Remove Table VII.E. – Closure/Post-closure Cost Summary from the permit.

Table VII.E.1. Permitted Unit Closure Cost Summary

This attached table is added to the permit.

Table VII.E.2. Permitted Unit Post-closure Cost Summary

This attached table is added to the permit.

This Class 3 Permit Modification is part of Permit and should be attached thereto.

Issued Date: MAR 12 2008

For the Commission

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PERMIT TABLE OF CONTENTS (CONT)

TABLE VII.E.2. - PERMITTED UNIT POST-CLOSURE COST SUMMARY

Existing Unit Post-Closure Cost Estimate	
Unit	Cost
Stormwater Pond	$359,700
Bauxite Pond	$141,050
Moat	$151,900
TOTAL EXISTING UNIT CLOSURE COST ESTIMATE	$652,650.00 (2007)[1]

Proposed Unit Post-Closure Cost Estimate	
Unit	Cost

[1] As units are added or deleted from these tables through future permit amendments or modifications, the remaining itemized unit costs should be updated for inflation when re-calculating the revised total cost in current dollars.

TABLE VII.E.1. - PERMITTED UNIT CLOSURE COST SUMMARY

Existing Unit Closure Cost Estimate	
Unit	Cost
Stormwater Pond	$1,174,000.00
TOTAL EXISTING UNIT CLOSURE COST ESTIMATE	$1,174,000.00 (2007)[1]

Proposed Unit Closure Cost Estimate	
Unit	Cost

[1] As units are added or deleted from these tables through future permit amendments or modifications, the remaining itemized unit costs should be updated for inflation when re-calculating the revised total cost in current dollars.

Texas Commission on Environmental Quality

Austin, Texas

COMPLIANCE PLAN FOR INDUSTRIAL SOLID WASTE MANAGEMENT SITE issued under provisions of TEXAS HEALTH AND SAFETY CODE ANN. Chapter 361 and Chapter 26 of the Texas Water Code

COMPLIANCE PLAN NO. 50112
EPA ID. NO. TXD008091290
ISW NO. 30311

This Compliance Plan is issued in conjunction with Permit No. 50112

This Compliance Plan supersedes and replaces Compliance Plan No. 50112 issued November 8, 1988 and as modified June 5, 1989, July 13, 1994, and July 29, 2002

First Issuance Date November 8, 1988

Name of Permittee:	Pasadena Refining System Incorporated 111 Red Bluff Road Pasadena, TX 77506
Site Owner:	Pasadena Refining System Incorporated 111 Red Bluff Road Pasadena, TX 77506
Registered Agent for Service:	C.T. Corporation 1021 Main Street, Suite 1150 Houston, TX 77002
Classification of Site:	Hazardous Waste Closure and Post-Closure Care

The Permittee is required to conduct the Corrective Action and Ground-Water Monitoring Programs in accordance with limitations, requirements, and other conditions set forth herein. All references herein refer to the Compliance Plan unless the Permit is specifically referenced. This Compliance Plan is issued subject to the rules and other Orders of the Commission and laws of the State of Texas. This Compliance Plan does not exempt the Permittee from compliance with the Texas Clean Air Act.

This Compliance Plan remains in effect until amended or revoked by the Commission. This Compliance Plan will be reviewed upon expiration of the authorization to store and process industrial solid waste pursuant to Permit No. 50112 and modified as necessary to assure compliance with 30 TAC Chapters 305, 335 and 350, where applicable.

ISSUED: MAR 12 2008

For The Commission

TABLE OF CONTENTS

I. GENERAL INFORMATION AND APPLICABILITY

A. The industrial solid waste management facility is located on approximately 170 acres of land along the southern bank of the Houston Ship Channel immediately east of the Washburn Tunnel approximately ½ -mile north of State Highway 225 in Harris County, Pasadena, Texas (Attachment A, Sheet 1). The facility is in the drainage area of Segment No. 1006 of the San Jacinto River Basin (North Latitude 29°43'27", West Longitude 95°12'22").

The term "Uppermost Aquifer" as referenced in this Compliance Plan refers to the Shallow Water bearing unit (Zone A), consisting of silty sand overbank deposits encountered at a depth of approximately 15 feet below ground surface (BGS). Zone A is separated from the deeper Zone C by approximately 10 feet of clay. Zone C consists of discontinuous, fluvial channel sand approximately 15 feet thick at its center. Groundwater in Zone A flows to the northwest while in Zone C groundwater is flowing to the west-southwest.

B. The Compliance Plan is specific to the waste management units listed in Table I (Parts A and B) and depicted in Attachment A, for which the groundwater Compliance Monitoring Program apply, pursuant to 30 TAC §335.165, or the Corrective Action Program apply, pursuant to 30 TAC §335.166, 30 TAC Chapter 335, Subchapter S and/or 30 TAC Chapter 350, for releases from RCRA-regulated units.

C. The Compliance Plan is specific to the Areas of Concern (AOCs) listed in Table IA and depicted in Attachment A, for which the Corrective Action Program applies pursuant to 30 TAC §335.167, 30 TAC Chapter 335, Subchapter S, 30 TAC Chapter 350 and Section IX. of this Compliance Plan.

D. The Compliance Plan is specific to the solid waste management units (SWMUs) and/or AOCs listed in Table II for which investigation and necessary corrective action applies pursuant to 30 TAC §335.167, 30 TAC Chapter 335, Subchapter S, 30 TAC Chapter 350 and Section VIII. of this Compliance Plan.

E. The Compliance Plan applies to any SWMU and/or AOC discovered subsequent to issuance of this Compliance Plan. The Permittee shall notify the executive director within fifteen (15) days of such discovery. Within sixty (60) days of discovering a SWMU or AOC, the Permittee shall submit an RCRA Facility Assessment (RFA) for that unit which shall be based on U.S. EPA RCRA Facility Assessment Guidance, October 1986, NTIS PB 87-107769. The purpose of an RFA is to identify releases or potential releases of hazardous waste, hazardous constituents or other constituents of concern from SWMUs or AOCs that may require corrective action. If the RFA indicates that there is a release or a potential for release that warrants further investigation, the Permittee shall conduct an investigation and necessary corrective action in accordance with Section VIII. of the Compliance Plan.

F. All dates in this Compliance Plan shall be referenced to the date of issuance of this Compliance Plan by the Texas Commission on Environmental Quality (TCEQ) unless otherwise specified. This Compliance Plan was developed based on the Compliance Plan Application dated May 7, 1998, and as revised January 4, 2000, and May 17, 2001, the June 5, 2001 submittal which contained a Sampling and Analysis Plan dated January 4, 2000, and

[I.F.]

the Class 3 modification transferring the moat from the detection monitoring program to the compliance monitoring program dated February 9, 2007 and revised March 21, 2007.

II. CORRECTIVE ACTION AND COMPLIANCE MONITORING SYSTEMS - Components and Functions Authorized

Corrective Action Systems are required for units specified in Table I, Part A. The Permittee is authorized to install and operate the following Corrective Action System components specified in Sections II.A. through II.G., subject to the limitations contained herein. Compliance Monitoring Systems are required for the units specified in Table I, Part B. The Permittee is authorized to install and operate the Compliance Monitoring System components specified in Section II.H., subject to the limitations contained herein.

For Corrective Action Systems:

A. Groundwater monitoring system shall at a minimum consist of the following categories of wells to monitor groundwater quality.

1. Background Well(s) unaffected by the operation of the facility.

2. Point of Compliance Wells to demonstrate compliance with the Groundwater Protection Standard (GWPS).

B. The Permittee is authorized to install and operate the following additional corrective action system wells to monitor groundwater quality and hydrogeological conditions of the aquifer.

1. Corrective Action Observation Wells to be utilized for water level measurements.

2. Corrective Action Supplemental Wells shall be used for evaluating the lateral and vertical extent of contamination and to evaluate the effectiveness of the remediation program.

3. Corrective Action System Wells to remediate and/or contain contaminated groundwater.

C. Groundwater Corrective Action System to effect withdrawal, treatment, and/or containment of contaminated groundwater and non-aqueous phase liquids (NAPLs) by means of recovery wells, interceptor trenches, bioremediation, air sparging and/or another alternate Corrective Action System design. Any alternate Corrective Action System designs proposed by the Permittee subsequent to issuance of this Compliance Plan that are equivalent to or exceed the performance of the Corrective Action Systems approved herein shall become part of the Compliance Plan upon approval by the executive director. The type of Corrective Action System in operation at the facility and an evaluation of system performance shall be reported in accordance with Section VII.C.2.

[II.]

D. Collection and conveyance system to store recovered groundwater and non-aqueous phase liquids (NAPLs), if found, prior to disposal at authorized facilities. If the recovered groundwater is characteristically hazardous and/or is contaminated with listed hazardous waste and the collection system does not meet the wastewater treatment unit exemption under 30 TAC §335.2(f) and §335.4(d), the collection system shall comply with the following regulations: 1) If the contaminated groundwater is stored without a permit or interim status for less than ninety (90) days, then the container and tank collection systems shall comply with provisions of 30 TAC §335.69(a)(1) / 40 CFR Part 265 Subparts I and J; 2) If the contaminated groundwater is stored for more than ninety (90) days, then the container and tank collection system shall comply with the provisions of 30 TAC §335.152(a)(7) & (8) / 40 CFR Part 264 Subparts I and J. The collection and conveyance system shall consist of the following components.

1. A groundwater corrective action system.

2. A groundwater storage system.

3. Appurtenances for the collection and conveyance of recovered contaminated groundwater and non-aqueous phase liquids (NAPLs), if applicable.

E. Treatment system to reduce the concentration of hazardous constituents to the concentration specified in Table III in contaminated groundwater by means of biological, physical, and chemical treatment processes.

F. Groundwater containment system to inhibit contaminated groundwater above Table III concentration limits from migrating beyond the influence of the corrective action system.

G. Permittee modifications to the Corrective Action System components in Section II.B. through II.F. subsequent to issuance of this Compliance Plan that are equivalent to or exceed the performance of the system approved herein shall become part of the Compliance Plan upon approval by the executive director.

<u>For Compliance Monitoring Systems</u>:

H. The Compliance Monitoring System shall consist of the following two categories of wells with which to establish groundwater quality:

1. Background Well(s) that is unaffected by the operation at the facility; and

2. Point of Compliance Wells to demonstrate compliance with the Groundwater Protection Standard.

III. GENERAL DESIGN, CONSTRUCTION, AND OPERATION REQUIREMENTS

A. All plans submitted with the Compliance Plan Application referenced in Section I.F. concerning the design, construction, and operation of the authorized components of the Corrective Action Groundwater Monitoring Programs and Groundwater Compliance Monitoring Program are approved. All plans must comply with this Compliance Plan and TCEQ Rules. Any alternate Corrective Action System designs proposed by the Permittee subsequent to issuance of this Compliance Plan that are equivalent to or exceed the performance of the Corrective Action Systems approved herein shall become part of the Compliance Plan upon approval by the executive director.

B. The following handling methods are authorized for recovered groundwater having concentrations of hazardous constituents exceeding the Groundwater Protection Standard:

1. Disposal at other authorized on-site facility or permitted off-site facility.

2. Any other treatment methods approved by the executive director.

The method(s) utilized for handling recovered groundwater shall be reported in accordance with Section VII.C.2.

C. The Permittee shall maintain a list of disposal methods and volume of all recovered contaminated groundwater pursuant to this Compliance Plan, including water purged from wells during sampling at each well, and make it available for inspection upon request.

D. Recovered NAPLs, if found, shall be managed (treatment, storage, and disposal), or recycled in an authorized on-site unit(s) or an off-site facility.

E. Well Construction, Installation, Certification, Plugging and Abandonment Procedures

1. For all wells to be constructed after issuance of this Compliance Plan that do not meet the well construction specifications identified in Attachment B, the Permittee shall submit to the executive director the proposed well location and construction diagram for approval at least thirty (30) days in advance of the anticipated date of installation or in accordance with an approved schedule for installation. These requirements may be met through submittal of a work plan by the Permittee and subsequent approval by the executive director. Well installation shall commence upon written approval of the executive director.

2. All wells shall be constructed and maintained so groundwater samples are representative of the aquifer's water quality. A record of drilling and construction details demonstrating compliance with the terms of this Section of this Compliance Plan shall be prepared in accordance with Attachment B. Wells constructed prior to issuance of this Compliance Plan may be utilized as groundwater monitoring wells if they meet the standards of Attachment B or are otherwise authorized by issuance of the Compliance Plan.

[III.E.]

3. The Permittee shall submit certification of well installation in accordance with Attachment B in the first report to be submitted pursuant to Section VII.C.2. after well installation is completed. If the Permittee or the executive director determines that the well integrity or materials of construction or well placement no longer enable the well to yield samples representative of groundwater quality, then the Permittee shall replace the well.

4. Unless the Permittee proposes an alternate well design that will result in wells of equivalent performance and specifications, each well installed after issuance of this Compliance Plan shall follow the design specifications contained in Attachment B of this Compliance Plan.

5. Prior to installation of a Point of Compliance, or Background replacement well listed in Table VI, the Permittee shall submit to the executive director for approval, the replacement well specifications and an explanation of why the well is being replaced. For any such well to be considered as a replacement well and not as a new well, the well shall have no substantive design changes from the well being replaced as determined by the executive director. The well shall be drilled within fifteen (15) feet of the well being replaced unless an alternate location is authorized by the executive director. The Permittee shall submit a replacement well certification to the executive director in accordance with Section VII.C.2. and Attachment B.

6. Plugging and abandonment of a Corrective Action System or Compliance Monitoring System: a) Background, and POC wells in Sections II.A. and II.H. shall be subject to the Compliance Plan modification provisions in 30 TAC Chapter 305, Subchapter D; and b) Corrective Action Observation and or Corrective Action System wells in Section II.B., shall commence upon written approval of the executive director. The well shall be plugged and abandoned in accordance with Attachment B. The Permittee shall certify proper plugging and abandonment in accordance with Section VII.C.2. and Attachment B.

F. The Permittee shall not install or maintain any drinking water or supply wells within plumes of groundwater contamination at the facility.

IV. CORRECTIVE ACTION AND COMPLIANCE MONITORING OBJECTIVES AND THE GROUNDWATER PROTECTION STANDARD

Corrective Action Objectives are listed in Sections IV.A. through IV.F. Compliance Monitoring Objectives are listed in Sections IV.G. through IV.O.

Corrective Action Objectives for units specified in Table I, Part A and C:

A. The Groundwater Protection Standard (GWPS) defines the objective of groundwater quality restoration, with respect to hazardous constituents, which is to be achieved at the Point of Compliance and beyond in accordance with Section V.A. by operation of the Corrective Action Program at this facility.

[IV.]

B. Point of Compliance is designated in Attachment A and further defined for purposes of this Compliance Plan by Table VI, which identifies Point of Compliance wells for which groundwater monitoring procedures will apply (Section VI.).

C. Hazardous constituents detected in groundwater are specified in Column A of Table III.

D. Concentration limits are specified in Table III as non-detectable values as determined by analytical method Practical Quantitation Limits (PQLs) based on Appendix IX of 40 Code of Federal Regulations (CFR) Part 264, Maximum Concentration of Constituents (MCCs) as listed in Table 1 of 30 TAC §335.160, and/or Alternate Concentration Limits (ACLs) in accordance with 30 TAC §335.160(b). These values shall be utilized as concentration limits of the Groundwater Protection Standard (GWPS) and shall be the values for statistical comparisons unless Table III is amended in accordance with current guidance and regulations to authorize Alternate Concentration Limits (ACL) as defined in 30 TAC §335.160 (b) or background values in accordance with Section VI.A. of this Compliance Plan or any other accepted levels as they are promulgated by the TCEQ or the Environmental Protection Agency. The executive director or the Permittee may request to replace concentration limits through a modification or amendment to this Compliance Plan in accordance with 30 TAC Chapter 305, Subchapter D. An application to modify/amend the concentration limits is required to be submitted if the criteria (i.e. risk-based demonstration, site-specific conditions, and/or off-site land use) originally used to establish the GWPS has changed and the current GWPS is not protective of human health and the environment.

E. Compliance Period for each unit is specified in Table VII.

F. Groundwater Protection Standard Achieved

1. Achievement of the GWPS in accordance with Section V.A. is defined by the results of the data evaluation of Section VI.D. wherein the concentrations of hazardous constituents have been reduced by the Corrective Action Program (Section V.) to concentrations that do not exhibit an increase when directly compared to the concentration limits of Table III or a statistically significant increase if statistical procedures are used.

2. If the GWPS is achieved at the RCRA-regulated units or waste management areas in accordance with Section V.A. in the corrective action area during the Compliance Period, the Permittee may apply to modify or amend this Compliance Plan to revise the Corrective Action Program to the extent necessary to demonstrate by means of the Groundwater Monitoring Program that the GWPS will not be exceeded during the remainder of the Compliance Period.

3. If the GWPS is not achieved at the RCRA-regulated units or waste management areas in accordance with Section V.A. in the corrective action area during the Compliance Period, the Corrective Action Program must continue until the GWPS has not been exceeded in all wells for that corrective action area for three (3) consecutive years.

[IV.F.]

4. If the GWPS established in this Compliance Plan for the RCRA-regulated unit or waste management area have not been exceeded for three (3) consecutive years at the end of the Compliance Period, then the Permittee must, within ninety (90) days, submit an application for a Compliance Plan/Permit modification or amendment to establish a Compliance Monitoring Program or a Detection Monitoring Program for the aquifer(s) during the remaining portion of the 30-year post-closure care period in accordance with 40 CFR Part §264.117. If the 30-year post-closure care period has expired, the Permittee may request groundwater monitoring for that RCRA-regulated unit or waste management area be discontinued. Until approval of the request, the Permittee shall continue groundwater monitoring under current Compliance Plan provisions for each RCRA-regulated unit or waste management area.

5. If the GWPS established in this Compliance Plan for a Non-Regulated Solid Waste Management Unit have not been exceeded for three (3) consecutive years for all wells for that unit, then the Permittee may apply for a modification or amendment to the Compliance Plan to terminate the Corrective Action Program for that unit.

Compliance Monitoring Objectives:

G. The Groundwater Protection Standard defines the concentration limits of hazardous constituents, with respect to groundwater quality in the Uppermost Aquifer, which are monitored at the Point of Compliance by operation of the Compliance Monitoring Program at this facility.

H. Point of Compliance is designated in Attachment A and is further defined for purposes of this Compliance Plan by Table VI, which identifies Point of Compliance Wells for which groundwater monitoring procedures will apply (Section VI.).

I. Table IIIA, Column A specifies hazardous constituents that are reasonably expected to be in or derived from waste placed in the units to be monitored annually at the Point of Compliance. Additional constituents may be added to Table IIIA. Non-detectable values, as determined by analytical method Practical Quantitation Limits (PQLs) based on Appendix IX of 40 CFR Part 264, are specified in Table IIIA, Column B. Groundwater analysis for each hazardous constituent shall utilize an analytical method listed in the United States Environmental Protection Agency publication SW-846 Test Methods for Evaluating Solid Waste, Third Edition, November 1986, (USEPA SW-846) and as listed in the July 8, 1987 edition of the Federal Register and later editions which is capable of measuring the concentration of the hazardous constituent at a concentration equal to or less than the corresponding value specified in Table IIIA except when matrix interference prevents achievement of that level.

J. Hazardous constituents detected in groundwater are specified in Table IVA, Column A. Additional constituents shall be added to Table IVA through a modification or amendment to this Compliance Plan in accordance with Section VII.B.2.

[IV.]

K. Concentration limits are specified in Table IVA, Column B as Maximum Concentration of Constituents (MCCs) as listed in Table 1 of 30 TAC §335.160 and Alternate Concentration Limits (ACLs) in accordance with 30 TAC §335.160(b). These values shall be utilized as concentration limits of the Groundwater Protection Standard and shall be the values for direct statistical comparisons unless Table IVA is amended in accordance with current guidance and regulations to authorize Alternate Concentration Limits (ACL) as defined in 30 TAC §335.160 (b) or background values in accordance with Section VI.A. of this Compliance Plan or any other accepted levels as they are promulgated by the TCEQ or the Environmental Protection Agency. The Executive Director or the Permittee may request to replace concentration limits through a modification or amendment to this Compliance Plan in accordance with 30 TAC Chapter 305, Subchapter D. A modification or amendment is also required to be submitted, in accordance with Section VII. of this Compliance Plan, if criteria (i.e., risk-based demonstration, site-specific conditions and/or off-site land use) originally used to establish a concentration limit has been determined to be less protective of human health and the environment.

L. The Compliance Period for each unit is specified in Table VII, which shall commence with the issuance of this Compliance Plan.

M. Compliance with the Groundwater Protection Standard for each well is defined by the results of the data evaluation of Section VI.D. wherein the concentrations of hazardous constituents do not exhibit a statistically significant increase (SSI) or exceed the concentration limits when directly compared to the concentration limits of Table IVA. If any Point of Compliance Well of Table VI is non-compliant with the Groundwater Protection Standard at any time during the Compliance Monitoring Program, the Permittee shall respond and report according to Section VII.

N. The groundwater Compliance Monitoring Program established by this Compliance Plan shall extend until expiration of the Compliance Period specified in Table VII. At the end of the Compliance Period, the Permittee shall either:

1. Submit a Permit modification or amendment request to re-establish a Detection Monitoring Program under 30 TAC §335.164 for the remaining portion of the 30-year post-closure care period in accordance with 40 CFR Part 264.117 if none of the hazardous constituents are detected at concentrations equal to or greater than the non-detectable value as determined by the appropriate analytical method PQL listed in Table IIIA. Until approval of the request, the Permittee shall continue groundwater monitoring under current Compliance Plan provisions;

2. Continue monitoring under the Compliance Monitoring Program if any hazardous constituent continues to be detected at concentrations equal to or greater than the non-detectable value as determined by the appropriate analytical method PQL or greater than the background value and the Groundwater Protection Standard is not exceeded during the remaining portion of the 30-year post-closure care period; or,

[IV.N.]

3. If the 30-year post-closure care period has expired, the Permittee may request groundwater monitoring be discontinued if the Groundwater Protection Standards of Table IVA are not exceeded at the end of the Compliance Period. Until approval of the request, the Permittee shall continue groundwater monitoring under current Compliance Plan provisions.

O. If it is determined that the current Compliance Monitoring System configuration is no longer adequate for detecting releases from the closed units, then the Permittee shall submit to the Executive Director a proposal to install new point of compliance wells in accordance with Section III.E. and Attachment B.

V. CORRECTIVE ACTION PROGRAM

The Corrective Action Program applies to units specified in Table I, Part A. The Corrective Action Program shall remediate, recover, and/or contain contaminated groundwater from the Uppermost Aquifer and any interconnected lower aquifers, if applicable. The Corrective Action Program shall consist of the system components of Section II., to be operated according to the specifications of this Compliance Plan. The Permittee shall conduct the Corrective Action Program until the performance standards of Section V.A. are met. The Permittee shall initiate the Corrective Action Program immediately upon issuance of this Compliance Plan, except where other specific response deadlines may apply.

A. Performance Standard

The Permittee shall conduct the Corrective Action Program to remedy the quality of groundwater by removing or treating in place the hazardous constituents so as to achieve the concentration limits specified in the Groundwater Protection Standard (GWPS) of Section IV. of this Compliance Plan in accordance with the following:

1. At the Point of Compliance and between the Point of Compliance and the downgradient facility property line;

2. Beyond the facility boundary where necessary to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of the executive director that, despite the Permittee's best efforts, the necessary permission from the property owner(s) was not received to undertake such action. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied;

3. Operate the Corrective Action System so as to intercept, contain and/or treat the area of contamination in the Uppermost Aquifer unless the system is under repair or maintenance; and,

4. Recommend changes to the configuration of the Corrective Action System at any time that it is determined that the contamination present in the Uppermost Aquifer, deeper zone, or any interconnected lower aquifers is not being effectively contained and/or remediated.

[V.A.]

5. The Permittee is required to actively remove NAPLs from the Uppermost Aquifer and any interconnected aquifers wherever found, to the extent technically practicable.

B. The Corrective Action Program shall consist of the system components of Section II.A. through II.G., to be operated according to the plans and specifications as approved in Section III.A. and the specifications of this Compliance Plan.

1. If groundwater recovery wells are utilized in the Corrective Action System, the flow rate at each Recovery Well or each Recovery Well System until each well can be measured individually shall be set and recorded monthly. This monthly flow rate data shall be used to calculate a semiannual total flow which shall be reported in accordance with Section VII.C.2.h. of this Compliance Plan.

2. All Corrective Action System components shall be maintained in a functional and leak-free condition. All above ground collection system pipes shall be inspected weekly. In addition, the area surrounding the wells shall be inspected weekly for visible signs indicating leaks in buried sections of the collection system. If a leak is detected in any part of the collection system, it must be reported within twenty-four (24) hours to the local TCEQ Region Office, and immediate action must be taken to stop the leak and resolve the problem.

3. The Permittee shall notify the executive director of any scheduled or non-scheduled periods of Corrective Action System shutdown, Corrective Action System malfunction, or treatment system shutdown for maintenance lasting more than thirty (30) days. The Permittee shall notify the executive director in writing no later than seven (7) days following the date the Permittee determines that the shutdown will last more than thirty (30) days. All shutdowns and malfunctions, irrespective of duration, shall be recorded in the facility's inspection log.

VI. GROUNDWATER MONITORING PROGRAM

The Permittee shall install, operate and maintain the Groundwater Monitoring System to evaluate the compliance status of the waste management units under the Compliance Monitoring Program and to evaluate the effectiveness of the Corrective Action Program for those units undergoing remediation, as applicable. The Groundwater Monitoring System, at a minimum, shall be composed of wells specified in Table VI, and shall include Background, Point of Compliance, and other wells as necessary which have been approved by the executive director.

A. Waste Management Area Specific Background Groundwater Quality

The Permittee may submit to the executive director for review and approval a plan to determine waste management area specific background values of the naturally-occurring hazardous constituents of Table III (for Corrective Action) and Table IIIA (for Compliance Monitoring) in lieu of the concentration limits given in these Tables. The plan shall include appropriate background well locations and screened intervals, well sampling schedules, and

[VI.A.]

methodology for determining and expressing background values in a form appropriate for the statistical evaluation of the monitoring results. Once background values have been established, the Permittee shall submit a modification or amendment request to the executive director in accordance with 30 TAC Chapter 305, Subchapter D to replace the concentration limits of Table III (for Corrective Action) and Table IIIA (for Compliance Monitoring) with the background values.

B. Sampling and Analysis Plan

1. Wells shall be sampled according to the Sampling and Analysis Plan referenced in Section I.F. The Sampling and Analysis Plan is hereby incorporated into the Compliance Plan by reference as if set out fully herein. The Permittee or the executive director shall propose modifications as necessary to the Sampling and Analysis Plan. Any and all revisions to the plan shall become conditions of this Compliance Plan at the beginning of the first quarter following approval by the executive director.

2. An up-to-date and approved Sampling and Analysis Plan shall be maintained at the facility and made available for inspection upon request.

3. The collected samples shall be analyzed in accordance with the current edition of U.S. EPA Publication SW-846, Test Methods for Evaluating Solid Waste and American Society for Testing and Materials (ASTM) Standard Test Methods or any other methods accepted by the TCEQ. Groundwater analyses required by this Compliance Plan shall utilize laboratory methods which are capable of measuring the concentration of each hazardous constituent at a concentration equal to or less than the corresponding value specified in Table III except when matrix interference prevents achievement of that level.

C. Sampling and Analysis Frequencies and Parameters

1. Frequencies of sampling are defined below:

a. "Week" and "month" shall be based upon a calendar week and month;

b. "Quarter" shall be based on divisions of the calendar year (i.e., January through March, April through June, July through September, October through December);

c. "Semiannual" shall be based on divisions of the calendar year (i.e., January through June, July through December) and consist of two consecutive quarters;

d. "Annual" or "Year" shall be four consecutive quarters, beginning with the first quarter. Years shall be designated consecutively, beginning with the "first year", "second year", etc; and,

[VI.C.1.]

e. "Calendar year" shall be based on divisions of the calendar (i.e. January through December).

2. Sampling of wells shall commence during the first complete quarter after issuance of this Compliance Plan. Thereafter, samples shall be collected on a semiannual basis during the first thirty (30) days of each first and third quarter. Data evaluations shall be completed within sixty (60) days of collection of the last sample date unless QA/QC procedures show that data is unacceptable and reanalyses or resampling must be performed. In such cases, the executive director will be notified as soon as it becomes apparent that the 60-day time limit will not be met.

3. In the first and subsequent years of groundwater monitoring, the wells shall be sampled and analyzed according to the following schedules:

a. Corrective Action Monitoring for units specified in Table I, Part A

i. Each Background Well, Point of Compliance (POC) Well and Corrective Action Supplemental Well shall be sampled and analyzed semiannually, and each Corrective Action System Well shall be sampled and analyzed at least biannually for the constituents of Table IV until the achievement of the Groundwater Protection Standards (GWPS) in accordance with Section IV.F. Corrective Action Observation Wells shown in Attachment A, Sheet 2 shall be monitored for water levels in accordance with Section VI.C.4.

ii. Each Corrective Action Supplemental Well, and Corrective Action System Well shall continue to be sampled according to Section VI.C. until any changes to these groups of wells are approved by the executive director pursuant to Section II.C.

iii. Each POC Well of Table VI shall be sampled for the constituents of Table IV according to Section VI.C. until analytical results satisfy the GWPS of Table IV for all POC (and POE, if any) Wells of that unit or area for two consecutive sampling events. All POC Wells shall then be sampled and analyzed semiannually for the constituents of Table III until all constituents of Table III are below the GWPS for all POC Wells of that unit or area in accordance with Section IV.F.

iv. If the GWPS is achieved in all Wells (Background, POC, Corrective Action Supplemental Well and Corrective Action System Wells) in accordance with Section IV.F.1., then the Permittee may apply to modify or amend the Compliance Plan according to Section IV.F.2., Section IV.F.4., or Section IV.F.5.

v. Any well with non-aqueous phase liquids (NAPLs) detected in the wellbore shall be considered as non-compliant with the GWPS and is not required to be analyzed for the constituents of Table III or Table IV.

b. Compliance Monitoring

i. If data evaluation is performed in accordance with Section VI.D.1., one sample from each Moat Point of Compliance Well and Background Well of Table VI shall be taken and analyzed semiannually for the constituents of Table IVA. If data evaluation is performed in accordance with Section VI.D.2., a sequence of at least four independent samples from each Moat Point of Compliance Well and Background Well of Table VI shall be taken and analyzed semiannually for the constituents of Table IVA; and,

ii. One sample from each Moat Point of Compliance Well of Table VI shall be taken and analyzed annually for Table IIIA during the first quarter of each year. Analysis for the hazardous constituents of Table IVA and Table IIIA may be accomplished with the same sample when sampling events coincide.

4. Field Determination Requirements - All Wells Specified in Section VII.C.2.c.

a. Water level measurements relative to Mean Sea Level shall be measured to within 0.01 ft and shall be performed during each sampling event effective immediately with issuance of this Compliance Plan. Measurements shall be taken in all monitor wells specified in this Compliance Plan.

b. Field determinations of pH, Temperature and Specific Conductivity are required for all Background, POC, Corrective Action Supplemental Well, and Corrective Action System Wells, excluding wells containing NAPLs. Turbidity in nephelometric turbidity units (NTUs) is required if micropurging techniques are utilized during sample collection.

c. Field observations including descriptions of appearance (clarity, color, etc.) shall be recorded semiannually for all Background, POC, Corrective Action Supplemental Well, and biannually for all Corrective Action System Wells, excluding wells containing NAPL.

d. The total depth of each well which is not equipped with a dedicated pump shall be measured during each sampling event. Total depth of each well which is equipped with a dedicated pump, shall be measured when: 1) pumps are removed for maintenance; or 2) the groundwater production rate of the dedicated pump decreases by 25% from the initial production rate when the pump was installed. The measured total depth shall be compared

[VI.C.4.d.]

to the total depth recorded on the well construction log. Should a comparison of the measured and the recorded total depth reveal that greater than 20% of the well screen has been silted in, the Permittee shall perform such actions necessary (redevelopment, replacement, etc.) to enable the well to function properly.

e. All wells specified in Section VII.C.2.c. shall be inspected during each sampling event in accordance with specifications in the Sampling and Analysis Plan. Repairs or a proposal for replacement for any affected well shall be performed within ninety (90) days of the routine sampling event inspection which identified the problem well.

D. Data Evaluation Procedures

Data evaluation in accordance with this Section shall be performed within sixty (60) days of sample collection for all wells for the duration of the Compliance Monitoring and the Corrective Action Monitoring program. When evaluating the monitoring results of each well pursuant to Section VI. for the constituents of Tables III or IV for corrective action monitoring and Tables IIIA or IVA for compliance monitoring, the Permittee shall either:

1. For corrective action monitoring: Directly compare the value of each constituent to the respective concentration limit of Table III or Table IV and determine if it is less than, equal to, or greater than the concentration limit. If the values for all the constituents are less than or equal to the respective concentration limits, then the well shall be considered compliant with the Groundwater Protection Standard (GWPS) for the sampling event. If one or more constituent value is greater than the respective concentration limit, then the well shall be considered non-compliant with the GWPS for the sampling event; or,

   For compliance monitoring: Directly compare the value of each constituent to the respective concentration limit of Table IIIA or Table IVA and determine if it is less than, equal to, or greater than the concentration limit. If the values for all the constituents are less than or equal to the respective concentration limits, then the well shall be considered compliant with the Groundwater Protection Standard (GWPS) for the sampling event. If one or more constituent value is greater than the respective concentration limit, then the well shall be considered non-compliant with the GWPS for the sampling event; or,

2. Compare the value of each constituent to its respective concentration limit of Table III or IV for corrective action monitoring or Table IIIA or IVA for compliance monitoring, using one of the following procedures:

   a. The Confidence Interval Procedure for the mean concentration based on a normal, log-normal, or non-parametric distribution. The 95 percent confidence coefficient of the t-distribution will be used in constructing the confidence interval (Section 6.2.1. of Statistical Analysis of Ground-Water

[VI.D.2.a.]

Monitoring Data at RCRA Facilities - Interim Final Guidance, U.S. EPA, April 1989) and the Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities - Addendum to Interim Final Guidance (July 1992). The confidence interval upper limit for each constituent shall be compared with the corresponding concentration limit in Table III or IV for corrective action monitoring. To be considered in compliance, the confidence interval upper limit for a well in question must not exceed the tabled concentration limit. A confidence interval upper limit above the tabled concentration limit shall be considered as evidence of statistically significant contamination; or,

b. An alternative statistical method proposed by the Permittee and approved by the TCEQ. Any proposed alternative method must be appropriate with respect to distributional assumptions and must provide reasonable control of both false positive and false negative error rates.

3. Within thirty (30) days of an initial data evaluation that determines concentration limits have been exceeded in a well pursuant to Sections VI.D.1. or VI.D.2., the Permittee may resample and repeat the analysis to verify concentration limits have been exceeded. If the second analysis indicates that the sample does not exceed the concentration limits, then the well shall be considered compliant with the concentration limits for the sampling event.

VII. RESPONSE AND REPORTING

A. Corrective Action Monitoring for units specified in Table I, Part A.

1. If the Permittee or the executive director determines that the Corrective Action Program required by this Compliance Plan no longer satisfies the requirements of 30 TAC §335.166 or §335.167, the Permittee must, within ninety (90) days of either the Permittee's determination or executive director's notification, submit an application for a Compliance Plan modification or amendment to make any appropriate changes to the Corrective Action Program which will satisfy the regulations.

2. If the executive director determines that the lateral or vertical extent of groundwater contamination is not delineated, the Permittee must, within ninety (90) days of the date of the executive director's notification unless otherwise directed, initiate an investigation to determine the extent of the contamination based on the Practical Quantitation Limits (PQLs) of 40 CFR Part 264 Appendix IX or other applicable standard as required or approved by the executive director.

B. Compliance Monitoring for units specified in Table I, Part B

1. Compliance with the Groundwater Protection Standard for each Point of Compliance Well of Table VI is defined by the results of the data evaluation of Section VI.D. wherein the concentrations of hazardous constituents do not exhibit a

[VII.B.1.]

statistically significant increase or exceed the concentration limits when directly compared to the concentration limits of Table IVA Column B. If the Permittee determines that any concentration limit of Table IVA is being exceeded pursuant to the procedures used in Section VI.D. at any Point of Compliance Well of Table VI, then the Permittee must notify the Executive Director of this finding in writing within seven (7) days. The notification must identify what concentration limits have been exceeded and indicate that the Permittee will either:

a. Submit a Compliance Plan modification or amendment to the Executive Director to establish a Corrective Action Program meeting the requirements of 30 TAC §335.166 within one hundred-eighty (180) days of such determination in accordance with 30 TAC §335.165(8)(B); or,

b. Demonstrate that a source other than the regulated unit caused the exceedance of the concentration limits of Table IVA or that the detection is an artifact caused by errors in sampling, analysis, or statistical evaluation or natural variation in the groundwater within ninety (90) days in accordance with 30 TAC §335.165(9).

2. If the Permittee finds Table IIIA constituents in groundwater samples from Point of Compliance Wells of Table VI that are not already identified in Table IVA as monitoring constituents, then the Permittee must either:

a. Report the concentration of the newly detected constituents to the Executive Director within Seven (7) days after the completion of the analysis. Within ninety (90) days after the completion of the analysis, the Permittee shall submit a modification or amendment application requesting that the constituent be added to the Table IVA monitoring list in accordance with 30 TAC Chapter 305, Subchapter D. The request shall propose a concentration limit for the Groundwater Protection Standard based on 30 TAC §335.160 for each constituent; or,

b. Resample within thirty (30) days of the initial findings and repeat the Table IIIA analysis. If the second analysis does not confirm the presence of the newly detected constituents, then the Permittee shall continue monitoring under the current Compliance Plan provisions. If the second analysis confirms the presence of the newly detected constituents, then the Permittee shall report the concentration of these additional constituents to the Executive Director within seven (7) days after the completion of the second analysis. Within ninety (90) days after completion of the second analysis, the Permittee shall submit a modification or amendment application requesting that the confirmed constituents be added to the Table IVA monitoring list in accordance with 30 TAC Chapter 305, Subchapter D. The request shall propose a concentration limit for the Groundwater Protection Standard based on 30 TAC §335.160 for each constituent.

[VII.B.]

3. If the Permittee or the Executive Director determines that the Compliance Monitoring Program required by this Compliance Plan no longer satisfies the requirements of 30 TAC §335.165, the Permittee must, within ninety (90) days of either the Permittee's determination or Executive Director's notification, submit an application for a Compliance Plan modification or amendment to make any appropriate changes to the Compliance Monitoring Program which will satisfy the regulations.

C. Reporting Requirements

1. Water table maps shall be prepared from the groundwater data collected pursuant to Section VI. and shall be evaluated by the Permittee with regard to the following parameters:

   a. Development and maintenance of a cone of depression during operation of the system;

   b. Direction and gradient of groundwater flow;

   c. Effectiveness of hydrodynamic control of the contaminated zone during operation; and,

   d. Estimation of the rate and direction of groundwater contamination migration.

2. For Corrective Action Programs: The Permittee shall submit a report to each recipient listed in Section XII.C. by January 21 and July 21 of each year and shall include the following information determined since the previously submitted report, if those items are applicable.

   For Compliance Monitoring Programs: The Permittee shall submit a report to each recipient listed in Section XII.C. by January 21st of each year and shall include the following information determined since the previously submitted report, if those items are applicable. The reporting period shall be based on the calendar year:

   a. The Corrective Action System(s) authorized under Section II.C. and the Interim Stabilization Measures program authorized under Section IX. in operation during the reporting period and a narrative summary of the evaluations made in accordance with Sections V., VI., and VII. of this Compliance Plan for the preceding reporting period. The reporting periods shall be January 1 through June 30 and July 1 through December 31 for Corrective Action Monitoring;

   b. The method(s) utilized for management of recovered/purged groundwater shall be identified in accordance with Section III.B.;

[VII.C.2.]

c. An updated table and map of all monitoring and corrective action system wells. The wells to be sampled shall be those wells proposed in the Compliance Plan Application referenced in Section I.F. and any changes subsequently approved by the executive director pursuant to Section II.C. Provide in chronological order, a list of those wells which have been added to, or deleted from, the groundwater monitoring and remediation systems since original issuance of the Compliance Plan. Include the date of TCEQ approval for each entry;

d. The results of the chemical analyses, submitted in a tabulated format acceptable to the executive director which clearly indicates each parameter that exceeds the GWPS. Copies of the original laboratory report for chemical analyses showing detection limits and quality control and quality assurance data shall be provided if requested by the executive director;

e. Tabulation of all water level elevations required in Section VI.C.4.a., depth to water measurements, and total depth of well measurements collected since the data that was submitted in the previous monitoring report;

f. Potentiometric surface maps showing the elevation of the water table at the time of sampling, delineation of the radius of influence of the Corrective Action System, and the direction of groundwater flow gradients outside any radius of influence;

g. A notation of the presence or absence of NAPLs, both light and dense phases, in each well during each sampling event since the last event covered in the previous monitoring report and tabulation of depth and thickness of NAPLs, if detected;

h. Quarterly tabulations of quantities of recovered groundwater and NAPLs, and graphs of monthly recorded flow rates versus time for the Recovery Wells or Recovery Well Systems during each reporting period. A narrative summary describing and evaluating the NAPL recovery program shall also be submitted;

i. Tabulation of the total contaminant mass recovered from each recovery system for each reporting period;

j. Tabulation of all data evaluation results pursuant to Section VI.D. and status of each well with regard to compliance with the Corrective Action and Compliance Monitoring objectives and compliance with the GWPS;

k. Maps of the contaminated area depicting concentrations of Table IV constituents and any newly detected Table III constituents as isopleth contours or discrete concentrations if isopleth contours cannot be inferred. Areas where concentrations of constituents exceed the GWPS should be clearly delineated;

[VII.C.2.]

l. Maps indicating the extent and thickness of the LNAPLs and DNAPLs, if detected;

m. An updated schedule summary as required by Section X.;

n. Summary of any changes made to the interim stabilization measures (ISM) program and/or monitoring/corrective action program and a summary of well inspections, repairs, and any operational difficulties;

o. A table of all modifications and amendments made to this Compliance Plan with their corresponding approval dates by the executive director or the Commission and a brief description of each action;

p. Corrective Measures Implementation (CMI) Report to be submitted in accordance with Section VIII.F., if necessary;

q. Summary of the status of ISM pursuant to Section IX.C.4.;

r. Tabulation of well casing elevations in accordance with Attachment B No. 16;

s. Recommendation for any changes;

t. Certification and well installation diagram for any new well installation or replacement and certification for any well plugging and abandonment;

u. Any other items requested by the executive director; and,

v. A summary of any activity within an area subject to institutional control under 30 TAC Chapter 335, Subchapter S or 30 TAC Chapter 350.

D. The Permittee shall enter all monitoring, testing, analytical, and inspection data obtained or prepared pursuant to the requirements of this Compliance Plan, including graphs and drawings, in the operating record at the facility. The operating record at the facility shall be made available for review by the staff of the TCEQ upon request.

VIII. CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

A. Corrective Action Obligations

The Permittee shall conduct corrective action as necessary to protect human health and the environment for all releases of hazardous waste, hazardous constituents and other constituents of concern from any Solid Waste Management Unit (SWMU) and/or AOC. The Permittee shall fulfill this obligation by conducting Corrective Action under 30 TAC §335.167, which consists of the RCRA Facility Investigation (RFI), and if necessary, Stabilization/Interim Corrective Measures, Baseline Risk Assessment (BLRA)/Corrective

[VIII.A.]

Measures Study (CMS) and Corrective Measures Implementation (CMI). The Permittee shall conduct an RFI (or alternate, but equivalent investigation) to determine whether hazardous waste or hazardous constituents listed in 40 CFR Part 261, Appendix VIII and/or 40 CFR Part 264, Appendix IX and/or other constituents of concern have been released into the environment. If it is determined that hazardous waste, hazardous constituents or other constituents of concern have been or are being released into the environment, then the Permittee may be required to conduct Stabilization/Interim Corrective Measures, a BLRA/CMS and/or a CMI which is protective of human health and the environment.

Upon executive director's review of Corrective Action obligations, the Permittee may be required to perform any or all of the following:

1. Conduct investigation(s);

2. Provide additional information;

3. Investigate additional SWMU(s) and/or AOC(s); and/or,

4. Submit an application for a modification/amendment to a Compliance Plan to implement corrective measures.

Any additional requirements must be completed within the time frame(s) specified by the executive director.

B. The Permittee shall conduct an RFI for the SWMUs and/or AOCs listed in Table II in accordance with Section I.D., and for the new SWMUs and/or AOCs discovered after the issuance of this Compliance Plan in accordance with Section I.E.

C. Variance From Investigation

The Permittee may elect to certify that no hazardous waste or hazardous constituents listed in 40 CFR Part 261, Appendix VIII and/or 40 CFR Part 264, Appendix IX or other constituents of concern are or never have been present/managed in a SWMU and/or AOC referenced in Section VIII.B. in lieu of performing the investigation required in Sections VIII.A. and VIII.D., provided that confirming data is submitted for the current and past waste(s) managed in the respective unit. The Permittee shall submit such information and certification(s) on a unit-by-unit basis in the time frame required in Section VIII.D. for review and approval by the executive director of the TCEQ. If the Permittee cannot demonstrate and certify that hazardous waste, hazardous constituents or other constituents of concern are not or were not present in a particular unit, the investigation required in Sections VIII.A. and VIII.D. shall be performed for the unit.

[VIII.]

D. RCRA Facility Investigation (RFI)

Within sixty (60) days from the date of issuance of this Compliance Plan and/or within sixty (60) days of approval of the RFA Report which recommends further investigation of a SWMU and/or AOC in accordance with Section I.E., the Permittee shall submit a schedule for completion of the RFI(s) (or alternate, but equivalent investigation) for the SWMUs and/or AOCs referenced in Section VIII.B. to the executive director for review and approval. The Permittee shall initiate the investigations in accordance with the approved schedule and shall address all of the items for RFI Workplan and RFI Report contained in the U.S. EPA publication EPA/520-R-94-004, OSWER Directive 9902.3-2A, RCRA Corrective Action Plan (Final), May 1994, or other guidance acceptable to the executive director. The results of the RFI must be submitted to the executive director for approval in the form of an RFI Report within the time frame established in the approved schedule. The RFI Report must appropriately document results of the investigation(s). The Report shall be considered complete when the full nature and extent of the contamination, the Quality Assurance/Quality Control procedures and the Data Quality Objectives are documented to the satisfaction of the executive director. The Permittee shall propose or conduct Stabilization/Interim Corrective Measures, as necessary, to protect human health and the environment.

E. Baseline Risk Assessment (BLRA)/Corrective Measures Study (CMS)

Upon approval of RFI Report, if it is determined that there has been a release of hazardous waste or hazardous constituents (listed in 40 CFR Part 261, Appendix VIII and/or 40 CFR Part 264 Appendix IX) or other constituents of concern into the environment, which poses a potential risk to human health and the environment, then the Permittee shall propose a remedy in accordance with the TCEQ Risk Reduction Standard (RRS) rules or the Texas Risk Reduction Program (TRRP) rules or as otherwise authorized by the executive director.

This may require a BLRA and/or CMS Report (or equivalent assessment and/or report) to be submitted for review and approval within the time frame(s) specified by the executive director. This Report will identify potential receptors and evaluate risk, and if necessary identify and evaluate corrective measure alternatives and recommend appropriate corrective measure(s) to protect human health and the environment. The BLRA and/or CMS Report (or equivalent assessment and/or report) shall address all of the applicable items in the RRS, TRRP or other rules acceptable to the executive director and the U.S. EPA publications EPA/520-R-94-004, OSWER Directive 9902.3-2A, RCRA Corrective Action Plan (Final), May 1994, or other guidance acceptable to the executive director.

F. Corrective Measures Implementation (CMI)

If on the basis of the RFI and/or BLRA/CMS it is determined that there is a risk to the human health and environment, then the Permittee shall submit for approval a CMI Workplan(s) within one-hundred-eighty (180) days of receipt of approval of the RFI and/or BLRA/CMS

[VIII.F.]

Report unless otherwise extended by the executive director. The CMI Workplan shall address all of the applicable items in the U.S. EPA publications EPA/520-R-94-004, OSWER Directive 9902.3-2A, RCRA Corrective Action Plan (Final), May 1994, or other guidance acceptable to the executive director. The CMI Workplan shall contain detailed final proposed engineering design, monitoring plans and time frames necessary to implement the selected remedy and assurances of financial responsibility for completing the corrective action. Following review and approval, and upon installation of a corrective action system based upon the approved CMI Workplan, the Permittee shall submit a CMI Report which includes as-built drawings of the corrective action system. The CMI Report shall address all the applicable items in the U.S. EPA publications EPA/520-R-94-004, OSWER Directive 9902.3-2A, RCRA Corrective Action Plan (Final), May 1994, or other guidance acceptable to the executive director.

If the CMI Workplan does not propose a permanent remedy, then the CMI Workplan shall be submitted as an application to modify/amend the Compliance Plan within the timeframes specified by the executive director. All the requirements of the previous paragraph apply to the corrective measures implemented through the Compliance Plan. Implementation of the corrective measure(s) shall be addressed through issuance of a modified/amended Compliance Plan.

To report the progress of the corrective measures, the Permittee shall submit periodic CMI Progress Reports to the TCEQ in accordance with the schedule specified in the Compliance Plan, or as otherwise directed.

IX. INTERIM STABILIZATION MEASURES (ISMs) PROGRAM

A. Applicability

The Interim Stabilization Measures (ISM) Program applies to waste management units or areas of concern (AOCs) under investigation for which a final Corrective Action Program has not been authorized by the Compliance Plan. The Permittee is authorized to conduct interim stabilization measures for the areas listed in Table IA, and Section I.C. of this Compliance Plan for which the investigation and remediation of theses plumes is also required pursuant to the May 21, 1986, Agreed Order. ISM also applies to units/AOCs that are discovered after issuance of this Compliance Plan.

B. ISMs Program Objectives

The objectives of the ISM Program are to remove, decontaminate, and/or stabilize the sources (i.e., waste and waste residues) and contaminated media and to intercept the groundwater contaminant plumes to control further migration of the contaminants in the uppermost aquifer and to protect human health and the environment. The Permittee shall modify the ISM Program, as necessary, to achieve these objectives.

[IX.]

C. ISMs Program Authorized

The Permittee is authorized to design, construct, operate and maintain a ISM Program for waste management units/AOCs for which interim measures are necessary to protect human health and the environment. The ISM Program shall be operated until final corrective measures established in accordance with Section VIII.F. are authorized in the Compliance Plan. At a minimum, the ISM Program shall consist of the following:

1. Specific performance goals to protect human health and the environment;

   ISM shall be conducted/operated so as to achieve applicable concentration limits under 30 TAC Chapter 335, Subchapter S or 30 TAC Chapter 350, at the Point of Exposure and/or at the downgradient facility property line and beyond the facility boundary where necessary to protect human health and the environment.

2. A monitoring system to evaluate the ISM and determine if the objectives outlined in Section IX.B. are being met. All ISM wells must comply with the requirements of Section III.E. and Attachment B of this Compliance Plan;

   Each Hydrocarbon System Monitoring Well shown in Attachment A, Sheets 3 and 4, and in Section X.B. shall be sampled and analyzed semiannually for the constituents to be submitted in accordance with Section X.C. until any change to these groups of wells or constituents are approved by the executive director pursuant to Section IX.C.5.

   Any well with NAPLS detected in the well bore shall be considered as non-compliant with the applicable groundwater standards and is not required to be analyzed for the list of ISM monitoring constituents.

   Fluid levels shall be measured semiannually in each Hydrocarbon System Monitoring, Recovery and Observation well shown in Attachment A, Sheets 3 and 4, and listed in Section X.B. until any changes in the groups of wells is approved by the executive director pursuant to Section IX.C.5.

3. An implementation schedule to initiate ISMs;

   Implementation of the ISM will commence within sixty (60) days of approval by the executive director.

4. Submittal of a report specifying the design of the ISM upon installation. During implementation of the ISM, periodic ISM Status Reports shall be submitted as part of the semiannual reports required by Section VII.C. which documents that the objectives of Section IX.B. are being achieved.

5. A procedure to modify the design, as necessary, to achieve the objectives outlined in Section IX.B. of this Compliance Plan.

[IX.C.5.]

Proposed modifications and/or changes to the ISM shall be submitted as part of the semiannual reports pursuant to Section VII.C. for approval by the executive director.

X. COMPLIANCE SCHEDULE

A. Within sixty (60) days of issuance of this Compliance Plan, the Permittee shall submit to the executive director a schedule summarizing all activities required by the Compliance Plan. The schedule shall list the starting dates of all routine activities. The Permittee shall include an updated schedule in the semiannual report. The schedule shall list the activity or report, the Compliance Plan Section which requires the activity or report and the calendar date the activity or report is to be completed or submitted (if this date can be determined).

B. Within ninety (90) days of issuance of the Compliance Plan, the Permittee shall install the new Hydrocarbon System Monitoring and recovery wells listed below, to be incorporated in to the ISM program.

1. New Hydrocarbon System Monitoring Program Wells:

   Install three (3) monitoring wells near the Houston Ship Channel downgradient of well R1-8 and R1-R6 in Region 1, and downgradient of well R2-8 in Region 2.

2. New Hydrocarbon System Recovery Wells:

   Install nine (9) recovery wells near the hydrocarbon observation wells R1-4 in Region 1; R3-1 in Region 3; 1885 in Region 4; R6-5 and R6-6 in Region 6; and, R7-10, OW-4, OW-8 and EEI#2 in Region 7.

C. Within sixty (60) days of issuance of the Compliance Plan, the Permittee shall submit to the executive director a list of Skinner List constituents to be monitored for the first year within each Hydrocarbon System Monitoring Well of the ISM Program. The list will be subject to change without modification /amendment to the Compliance Plan upon written approval by the executive director, subsequent to establishing a baseline during the first year of ISM monitoring.

D. Within two (2) years of issuance of the Compliance Plan, the Permittee shall submit a pre-qualifying checklist to establish a Facility Operations Area (FOA) to address multiple sources of constituents of concern (COCs). A compliance plan application shall be submitted on a schedule agreed upon by the executive director and shall include the appropriate information as required by 30 TAC § 350.131

XI. FINANCIAL ASSURANCE

The Permittee shall provide financial assurance for operation of the Groundwater Monitoring and Corrective Action Programs, as applicable, in accordance with this Compliance Plan in a form acceptable to the executive director in an initial amount not less than $1,085,300.00 within ninety (90) days of issuance of this Compliance Plan. The financial assurance shall be secured, maintained,

[XI.]

and adjusted in compliance with TCEQ regulations on hazardous waste financial requirements (30 TAC §335.152 and §335.167 and 40 CFR Part 264 Subpart H).

XII. GENERAL PROVISIONS

A. Deed Recordation Requirements

For waste and contaminated soil (including saturated soils) approved to remain in place above background concentration levels after completion of the corrective action and/or groundwater monitoring programs, the Permittee shall record an instrument in the county deed records for the facility to specifically identify the areas of contamination exceeding background values. The deed certification shall follow the requirements of 30 TAC §335.560 and §335.569 or 30 TAC §350.111, where applicable.

B. Notification Requirements

The Permittee shall notify the local TCEQ region office at least ten (10) days prior to any well installation or sampling activity required by the Compliance Plan in order to afford Region personnel the opportunity to observe these events and collect samples. This notification requirement will not apply to the routine semiannual or annual groundwater sampling events specified in this Compliance Plan.

C. Distribution of Copies

The Permittee shall submit all schedules, plans, and reports required by this Compliance Plan according to the following distribution list:

1. An original and one copy to the Corrective Action Section, Mail Code MC-127, Remediation Division, TCEQ in Austin, Texas; and,

2. One copy to the Waste Program, TCEQ Region 12 Office in Houston, Texas.

D. Compliance Plan Modification or Amendment

If the Permittee determines that the Compliance Monitoring Program, Corrective Action Program, Compliance Schedule, or Financial Assurance required by this Compliance Plan no longer satisfies the requirements of 30 TAC §335.165, §335.166 or §335.167, the Permittee must, within ninety (90) days of making this determination, submit an application for a modification or amendment to make any appropriate changes to the Compliance Plan which will satisfy the regulations. Any application to modify or amend the Compliance Plan shall be accomplished in accordance with the provisions of 30 TAC Chapter 305, Subchapter D and submitted to the Industrial and Hazardous Waste Permits Section, Permits Division, Mail Code MC-130, TCEQ in Austin, Texas.

E. Any changes to the Corrective Action or Groundwater Monitoring Systems are subject to executive director's approval.

XIII. FORCE MAJEURE

The Permittee's non-compliance with one or more of the provisions of this Compliance Plan may be justified only to the extent and for the duration that non-compliance is caused by a "Force Majeure" event. For purposes of this Compliance Plan, "Force Majeure" is defined as an event that is caused by an Act of God, labor strike, or work stoppage, or other circumstance beyond the Permittee's control that could not have been prevented by due diligence, and that makes substantial compliance with the applicable provision or provisions of this Compliance Plan impossible.

The occurrence of a "Force Majeure" event that justifies the missing of one deadline shall not automatically justify the missing of later deadlines unless there is a cumulative effect due to such an event. The Permittee shall keep a record of any delaying events.

If the Permittee anticipates or experiences an inability to comply with any of the provisions of this Compliance Plan due to a "Force Majeure" event, the Permittee shall notify the executive director (TCEQ) immediately (within 24 hrs). A written notice must be submitted to the TCEQ within ten (10) days, which describes the nature, cause, and anticipated length of the delay and all steps which the Permittee has taken and will take, with a schedule for their implementation, to avoid or minimize the delay. In the event that performance of any of the activities required by this Compliance Plan is affected by a "Force Majeure" event, then the Permittee shall propose a plan for the executive director's (TCEQ) approval, for achieving the objectives of the Compliance Plan by alternative means in the most timely manner.

TABLE I
Waste Management Units Subject to Groundwater
Corrective Action and Compliance Monitoring

The Compliance Plan is specific to the following waste management units or areas for which the groundwater Corrective Action apply, pursuant to 30 TAC §335.166 for releases from RCRA-regulated units. The Compliance Plan is also specific to waste management units listed below for which the Corrective Action Program applies pursuant to 30 TAC §335.167 for releases from the solid waste management units.

A. RCRA-REGULATED UNITS SUBJECT TO THE CORRECTIVE ACTION PROGRAM (See also Attachment A, Sheet 2):

1. Ponds Waste Management Area [Groundwater Regions 3 and 4 consisting of the Stormwater Pond (NOR Unit No. 002) and the Bauxite Pond (NOR Unit No. 007)].

B. RCRA-REGULATED UNITS SUBJECT TO THE COMPLIANCE MONITORING PROGRAM:

1. The Moat (NOR Unit No. 001).

C. SOLID WASTE MANAGEMENT UNITS SUBJECT TO THE CORRECTIVE ACTION PROGRAM [Reserved]:

TABLE IA
Areas of Concern Addressed in Section IX.

The Compliance Plan is specific to the following groundwater contaminant plumes (depicted in Attachment A, Sheet 3 and 4) designated for the interim stabilization measures (ISM) in accordance with Section IX. of the Compliance Plan pursuant to 30 TAC §335.167 for releases from solid waste management units (SWMUs) or AOCs. The investigation and remediation of these plumes is also required pursuant to the May 21, 1986 Agreed Order:

1. Region 1, north of Tank 808;

2. Region 2, north of Tank 824;

3. Region 5, south of Stormwater Pond;

4. Region 6, near the Ship Docking Area on the Houston Ship Channel; and,

5. Region 7, near the Washburn Tunnel.

TABLE II
Solid Waste Management Units and Areas of Concern
Addressed in Section VIII.

The Compliance Plan is specific to the following units for which investigation and necessary corrective action applies pursuant to 30 TAC §335.167 for releases from solid waste management units (SWMUs) and Areas of Concern (AOCs). The SWMUs and AOCs are also depicted in Attachment A, Sheets 5 through 13:

SWMU No.

1. Tank Fire Walls (consisting of total of 33 Tanks: 1, 2, 47, 50, 51, 85, 97, 202, 203, 204, 206, 314, 315, 316, 317, 319, 320, 321, 322, 323, 324, 325, 326, 327, 330 (formerly 207), 331, 332, 348, 811, 820, 824, 825, and 826,);

2. Buried Cell Near the Bauxite Pond;

3. Trap No. 2 Sump (NOR Unit No. 015);

4. Waste Pile Containing Coke at Gate 14 (NOR Unit No. 005);

5. Area immediately surrounding the Bauxite Pond;

6. Dehydrator Tank Fire Walls;

7. Maintenance Area Ditch;

8. Detol Pad; and,

9. Sandblast Grit Pile.

TABLE III - CORRECTIVE ACTION PROGRAM
Table of Detected Hazardous and Solid Waste Constituents and
Concentration Limits for the Groundwater Protection Standard

COLUMN A Hazardous Constituents	COLUMN B Concentration Limits (mg/l)
1. Ponds Waste Management Area	
Benzene	0.005[MCL]
o-Cresol	5.1[MSC]
m and p - Cresol	5.1[MSC]
2,4-Dimethylphenol	2[MSC]
2-Methylnaphthalene	2[MSC]
Naphthalene	2[MSC]
Phenol	61[MSC]
Toluene	1[MCL]
Ethylbenzene	0.7[MCL]
Xylenes	10[MCL]

MSC Alternate Concentration Limit pursuant to 30 TAC §335.160(b) based upon the Medium-Specific Concentration (MSC), Industrial Risk Reduction Standard No. 2 specified in 30 TAC Chapter 335, Subchapter S.

MCL Alternate Concentration Limit pursuant to 30 TAC §335.160(b) based upon the Maximum Contaminant Level (MCL) specified in 40 CFR Part 141, National Primary Drinking Water Regulations Subparts B and G.

TABLE IIIA
COMPLIANCE MONITORING PROGRAM
Table of Hazardous and Solid Waste Constituents and
Practical Quantitation Limits or Background Values for Compliance Monitoring

	COLUMN A Hazardous Constituents	COLUMN B Practical Quantitation Limits (mg/l)
1. The Moat		
	Chromium	0.03[ND]
	Lead	0.05[ND]
	Benzene	0.005[ND]
	Ethylbenzene	0.005[ND]
	1,1,1-Trichloroethane	0.005[ND]
	Xylenes	0.005[ND]
	o-Cresol (2-methylphenol)	0.01[ND]
	m and p-Cresols	0.01[ND]
	Naphthalene	0.01[ND]
	Phenol	0.01[ND]

ND Non-detectable at Practical Quantitation Limit as determined by the analytical methods of the United States Environmental Protection Agency publication SW-846 Test Methods for Evaluating Solid Waste, Third Edition, November 1986, (USEPA SW-846) and as listed in the July 8, 1987 edition of the Federal Register and later editions. Practical Quantitation Limit (PQL) is indicated in parentheses. Practical Quantitation Limits are the lowest concentrations of analytes in groundwaters that can be reliably determined within specified limits of precision and accuracy by the indicated methods under routine laboratory operating conditions.

TABLE IV - CORRECTIVE ACTION PROGRAM
Table of Indicator Parameters and Concentration Limits for
the Groundwater Protection Standard

COLUMN A Hazardous Constituents	COLUMN B Concentration Limits (mg/l)
1. Ponds Waste Management Area	
Benzene	0.005[MCL]
Naphthalene	2[MSC]
2-Methylnaphthalene	2[MSC]

MSC Alternate Concentration Limit pursuant to 30 TAC §335.160(b) based upon the Medium-Specific Concentration (MSC), Industrial Risk Reduction Standard No. 2 specified in 30 TAC Chapter 335, Subchapter S.

MCL Alternate Concentration Limit pursuant to 30 TAC §335.160(b) based upon the Maximum Contaminant Level (MCL) specified in 40 CFR Part 141, National Primary Drinking Water Regulations Subparts B and G.

TABLE IVA
COMPLIANCE MONITORING PROGRAM
Table of Detected Hazardous Constituents and Concentration Limits for the Groundwater protection Standard for Compliance Monitoring

	COLUMN A Hazardous Constituents	COLUMN B Concentration Limits (mg/l)
1. The Moat		
	Barium	2[MCL]
	Toluene	1[MCL]

MCL Alternate Concentration Limit pursuant to 30 TAC §335.160(b) based upon the Maximum Contaminant Level (MCL) specified in 40 CFR Part 141, National Primary Drinking Water Regulations Subparts B and G.

TABLE VI
Designation of Wells by Function for Compliance Monitoring Program and Corrective Action Program

COMPLIANCE MONITORING PROGRAM - THE MOAT

10. POINT OF COMPLIANCE WELLS

    a. Shallow (Zone A): 1M85, 3M85, 6M85 and 7M85

11. POINT OF EXPOSURE WELLS [Reserved]

12. BACKGROUND WELLS

    a. 2M85

CORRECTIVE ACTION PROGRAM - PONDS WASTE MANAGEMENT AREA (consists of Storm water and Bauxite Ponds)

1. POINT OF COMPLIANCE WELLS

    a. Ponds Waste Management Area (consists of the Storm water and Bauxite Ponds)
    Shallow (Zone A): R3-4, R4-1, 1587, 1785R, 1885R and 1985
    Deep (Zone C): 2P86, 3P86 and 4P87

2. POINT OF EXPOSURE WELLS [Reserved]

3. BACKGROUND WELLS

    a. Ponds Waste Management Area
    5 and R5-6

Note: Wells and piezometers identified on Attachment A maps that are not listed in this table are subject to change, upon approval by the executive director, without modification to the Compliance Plan.

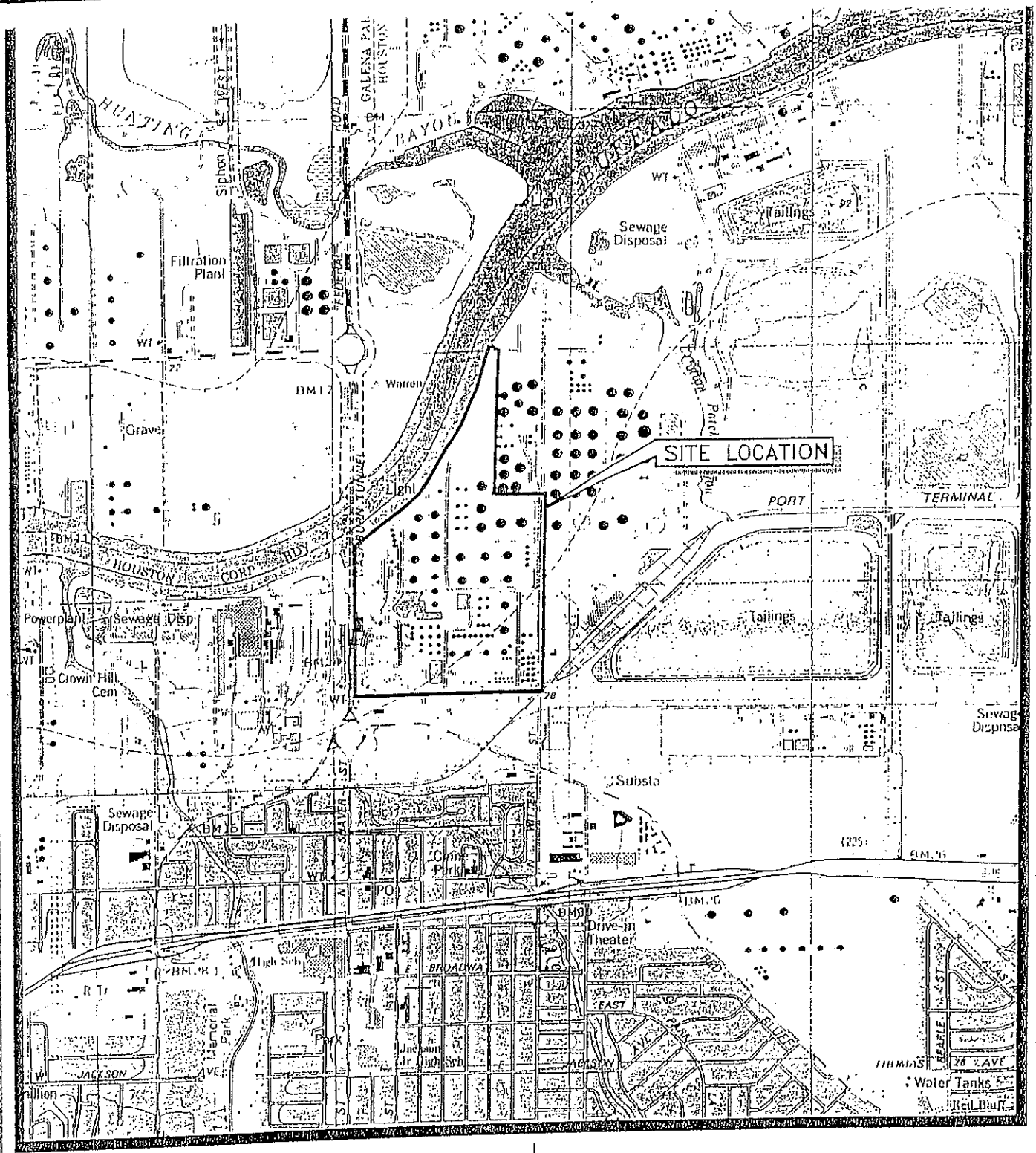
TABLE VII
Compliance Period

The Moat

Year Waste Management Activities Initiated	1979
Year Closed	1991
Compliance Period	12 Years
Compliance Period Began	2007

Ponds Waste Management Area (consisting of the Stormwater and Bauxite Ponds)

Year Waste Management Activities Initiated	1973
Year Closed	1993
Compliance Period	20 Years
Compliance Period Began	1998



SOURCE: USGS 7.5 MIN. PASADENA, TEXAS QUAD SHEET (1982).

SCALE IN FEET

0 1000 2000 4000

N

Attachment A, Sheet 1 of 13
Facility Site Location Map
Crown Central Petroleum Corporation - Pasadena
Compliance Plan No. CP-50112-000

PLOT DATA
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Operator Name: DWH
Scale: 1=1
Plot Time:
Plot Date:
Dwg Size: BX11
Attached Xref's:

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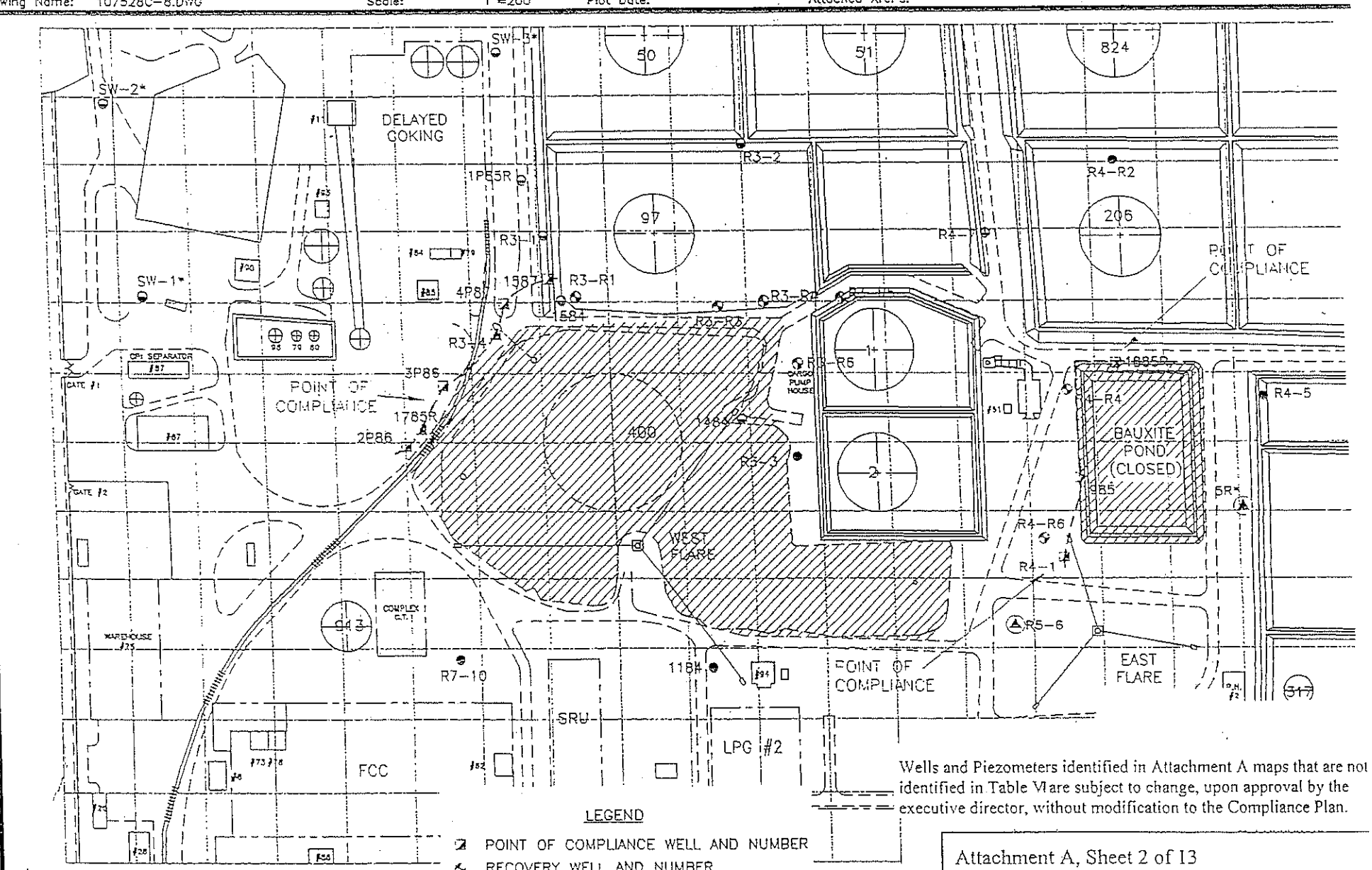
Operator Name: SSW
Scale: 1"=200'
Plot Time:
Plot Date:
Dwg Size: 8X11
Attached Xref's:



* TO BE INSTALLED

LEGEND

- POINT OF COMPLIANCE WELL AND NUMBER
- RECOVERY WELL AND NUMBER
- SUPPLEMENTAL WELL AND NUMBER
- BACKGROUND WELL AND NUMBER
- OBSERVATION WELL AND NUMBER Water levels only
- PONDS WASTE MANAGEMENT AREA
- POINT OF COMPLIANCE

Wells and Piezometers identified in Attachment A maps that are not identified in Table VI are subject to change, upon approval by the executive director, without modification to the Compliance Plan.

Attachment A, Sheet 2 of 13
Well Location Map for
Ponds Waste Management Area
Crown Central Petroleum Corporation - Pasadena
Compliance Plan No. CP-50112-000

Hydrocarbon System Monitoring Wells

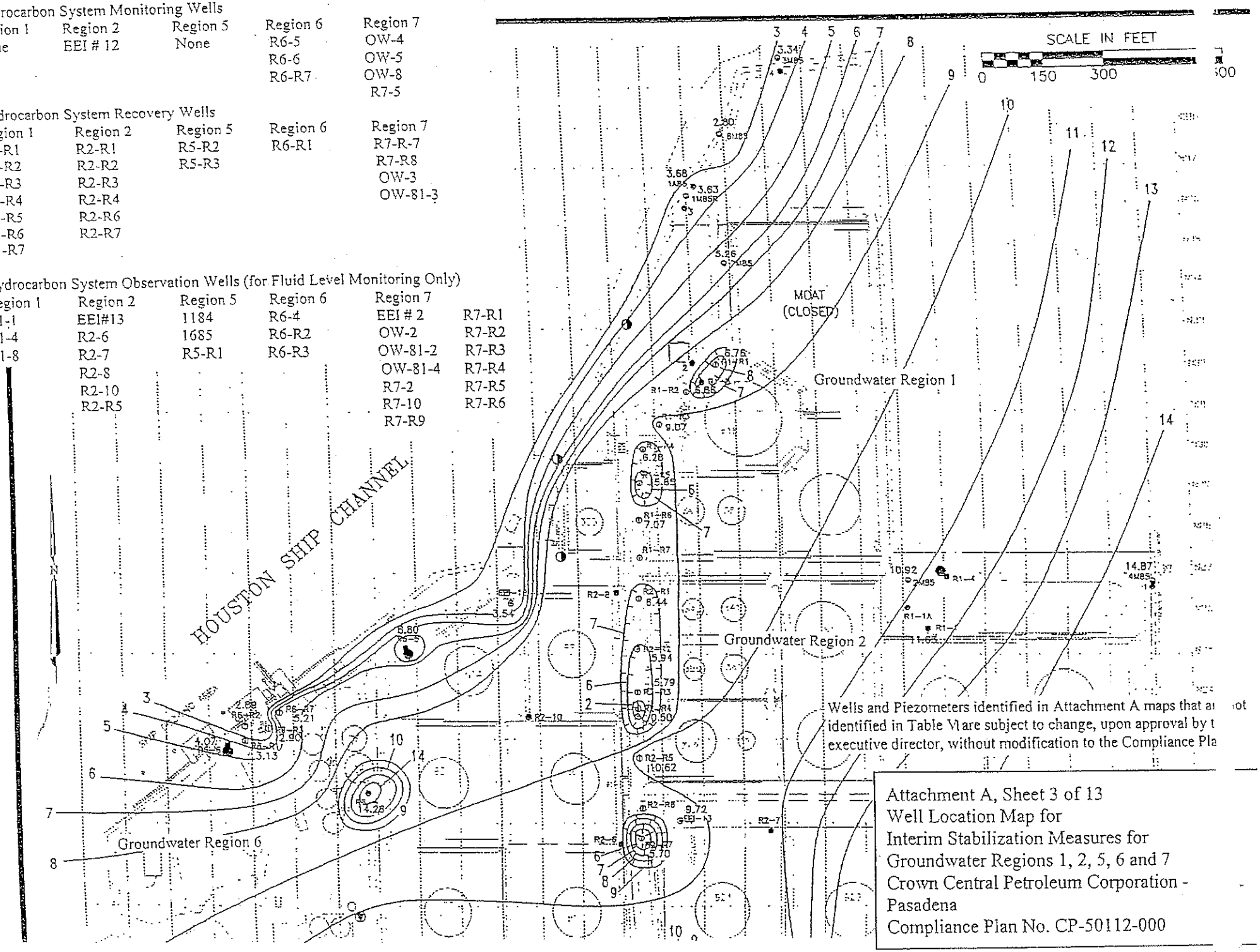
Region 1	Region 2	Region 5	Region 6	Region 7
None	EEI # 12	None	R6-5	OW-4
			R6-6	OW-5
			R6-R7	OW-8
				R7-5

Hydrocarbon System Recovery Wells

Region 1	Region 2	Region 5	Region 6	Region 7
R1-R1	R2-R1	R5-R2	R6-R1	R7-R-7
R1-R2	R2-R2	R5-R3		R7-R8
R1-R3	R2-R3			OW-3
R1-R4	R2-R4			OW-81-3
R1-R5	R2-R6			
R1-R6	R2-R7			
R1-R7				

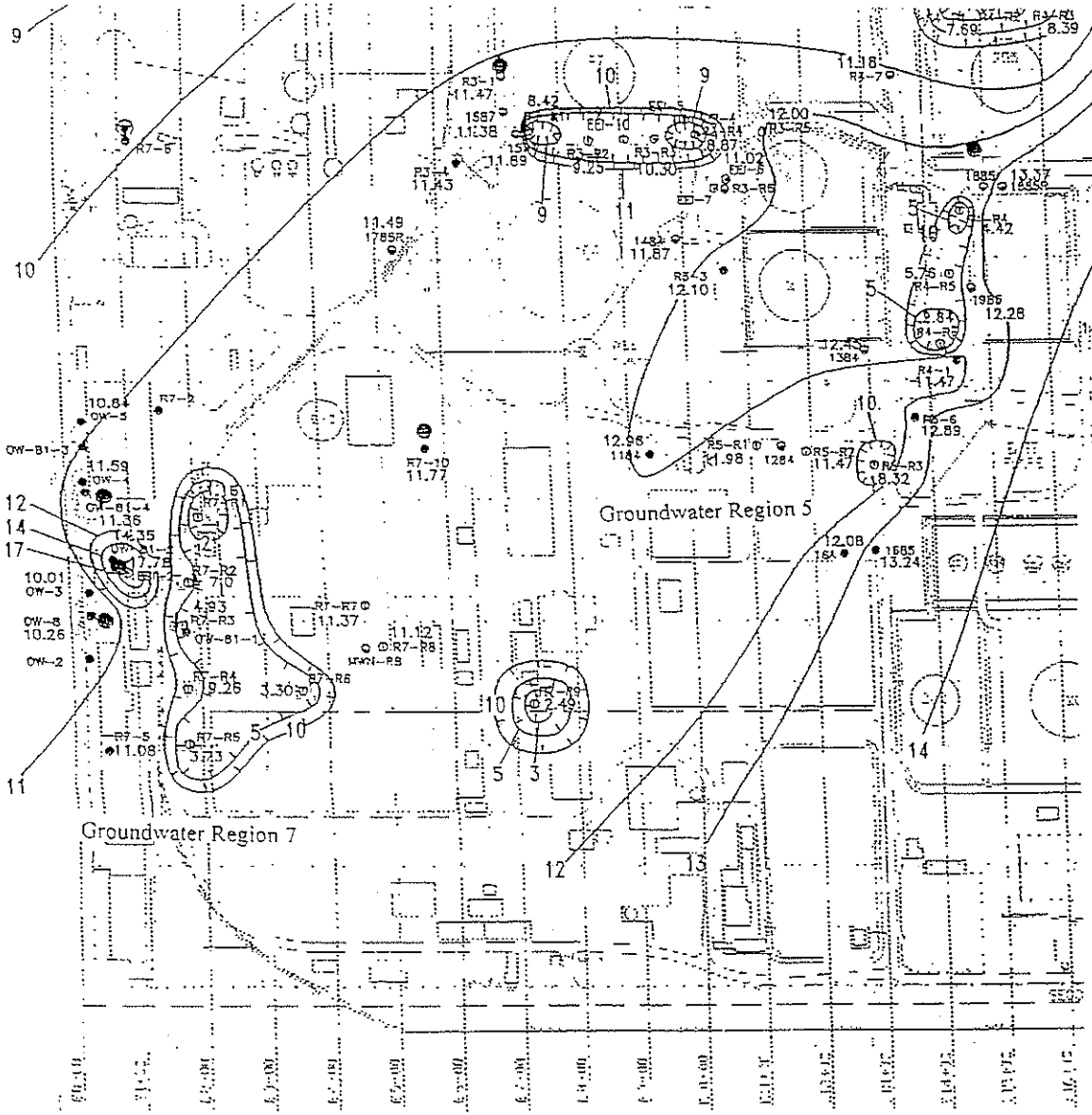
Hydrocarbon System Observation Wells (for Fluid Level Monitoring Only)

Region 1	Region 2	Region 5	Region 6	Region 7	
R1-1	EEI#13	1184	R6-4	EEI # 2	R7-R1
R1-4	R2-6	1685	R6-R2	OW-2	R7-R2
R1-8	R2-7	R5-R1	R6-R3	OW-81-2	R7-R3
	R2-8			OW-81-4	R7-R4
	R2-10			R7-2	R7-R5
	R2-R5			R7-10	R7-R6
				R7-R9	



Wells and Piezometers identified in Attachment A maps that a ot identified in Table VI are subject to change, upon approval by t executive director, without modification to the Compliance Pla

Attachment A, Sheet 3 of 13
Well Location Map for
Interim Stabilization Measures for
Groundwater Regions 1, 2, 5, 6 and 7
Crown Central Petroleum Corporation - Pasadena
Compliance Plan No. CP-50112-000



Wells and Piezometers identified in Attachment A Maps that are not identified in Table VI are subject to change, upon approval by the executive director, without modification to the Compliance Plan.

Designation of Interim Corrective Action Wells by Function

Hydrocarbon System Monitoring Wells

Region 1	Region 2	Region 5	Region 6	Region 7
None	EEI # 12	None	R6-5	OW-4
			R6-6	OW-5
			R6-R7	OW-8
				R7-5

Hydrocarbon System Recovery Wells

Region 1	Region 2	Region 5	Region 6	Region 7
R1-R1	R2-R1	R5-R2	R6-R1	R7-R-7
R1-R2	R2-R2	R5-R3		R7-R8
R1-R3	R2-R3			OW-3
R1-R4	R2-R4			OW-81-3
R1-R5	R2-R6			
R1-R6	R2-R7			
R1-R7				

Hydrocarbon System Observation Wells (for Fluid Level Monitoring Only

Region 1	Region 2	Region 5	Region 6	Region 7	
R1-1	EEI#13	1184	R6-4	EEI # 2	7-R1
R1-4	R2-6	1685	R6-R2	OW-2	7-R2
R1-8	R2-7	R5-R1	R6-R3	OW-81-2	7-R3
	R2-8			OW-81-4	7-R4
	R2-10			R7-2	7-R5
	R2-R5			R7-10	7-R6
				R7-R9	

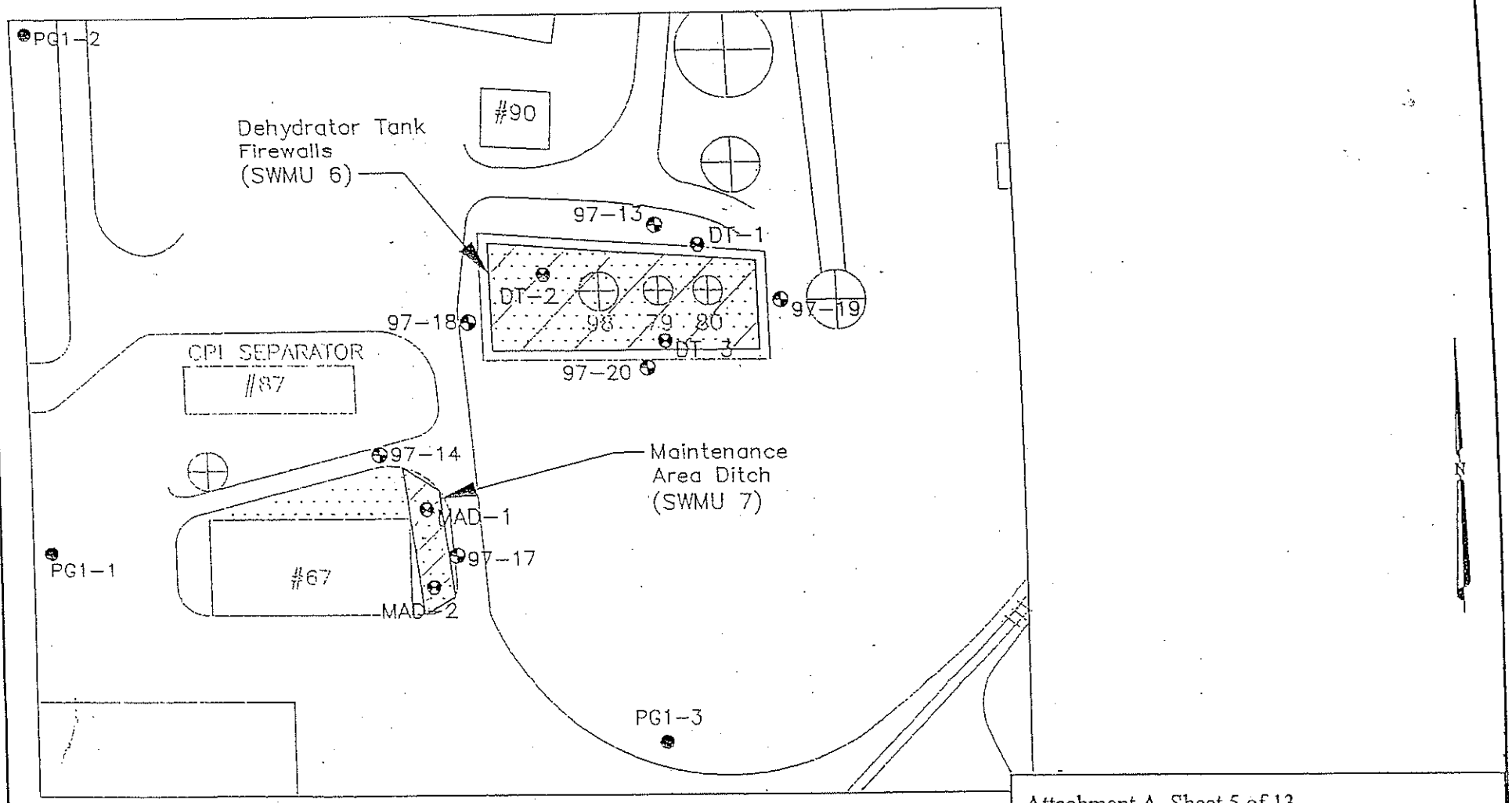
LEGEND

- 7M85 MONITOR WELL LOCATION & NUMBER
- EEI–2 MONITOR WELL LOCATION & NUMBER (PRE–1985)
- OW–2 OBSERVATION WELL LOCATION & NUMBER
- R4–R6 RECOVERY WELL LOCATION & NUMBER
- 3.73 CORRECTED PUMPING GROUND–WATER ELEVATIONS (FEET MSL)
- 9 CONTOUR OF CORRECTED PUMPING GROUND–WATER ELEVATIONS (FEET MSL)
- AREA OF FREE–PHASE HYDROCARBON
- PROPOSED COMPLIANCE PLAN MONITOR WELL LOCATION
- PROPOSED HYDROCARBON RECOVERY WELL LOCATION
- PROPOSED HYDROCARBON SYSTEM MONITOR WELL LOCATION
- WELL TO BE PHASED OUT OF RECOVERY PROGRAM

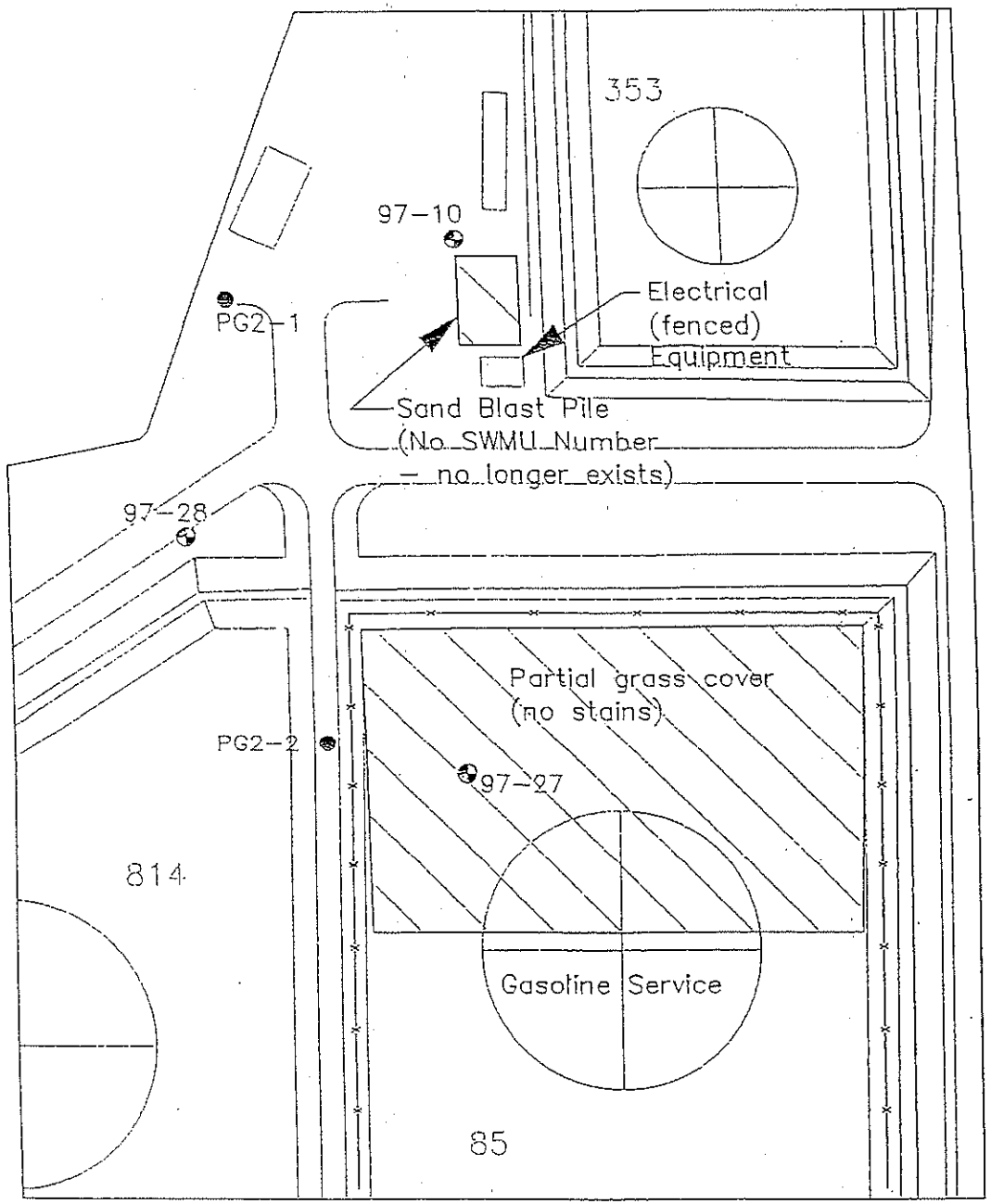
SCALE IN FEET

0 150 300 600

Attachment A, Sheet 4 of 13
Well Location Map for
Interim Stabilization Measures for
Groundwater Regions 1, 2, 5, 6 and 7
Crown Central Petroleum Corporation - Pasadena
Compliance Plan No. CP-50112-000



Attachment A, Sheet 5 of 13
SWMUs Location Map Requiring an RFI
pursuant to Compliance Plan Provision VIII
Crown Central Petroleum Corporation -
Pasadena
Compliance Plan No. CP-50112-000



LEGEND

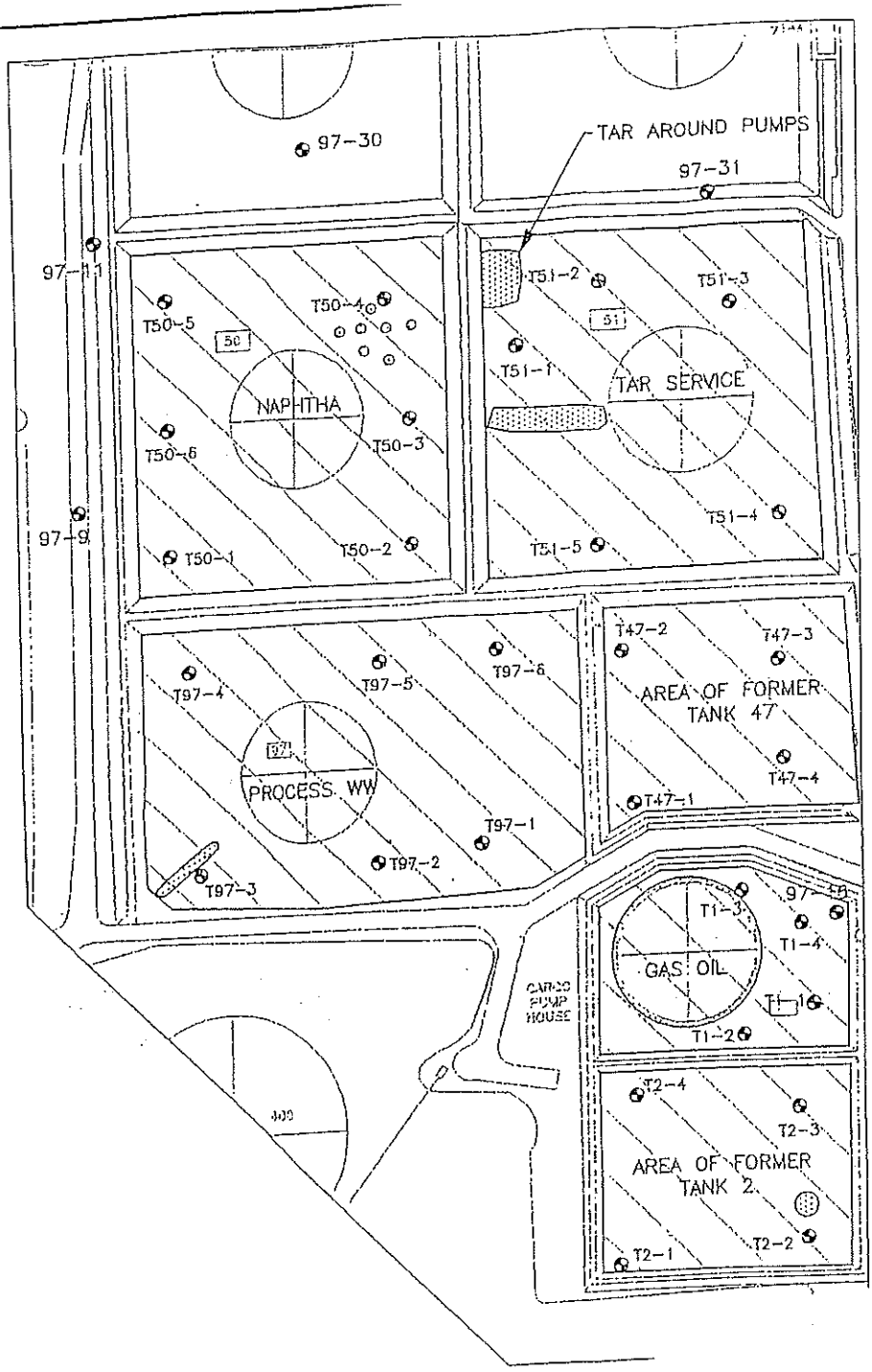
- 97-12 SOIL BORING LOCATION & NUMBER (1991,1997)
- PG1-1 SOIL BORING LOCATION & NUMBER (1999)
- AREA OF SOLID WASTE MANAGEMENT UNIT

N

SCALE IN FEET

0 75 150

Attachment A, Sheet 6 of 13
SWMUs Location Map Requiring an RFI
pursuant to Compliance Plan Provision VIII
Crown Central Petroleum Corporation -
Pasadena
Compliance Plan No. CP-50112-000



LEGEND

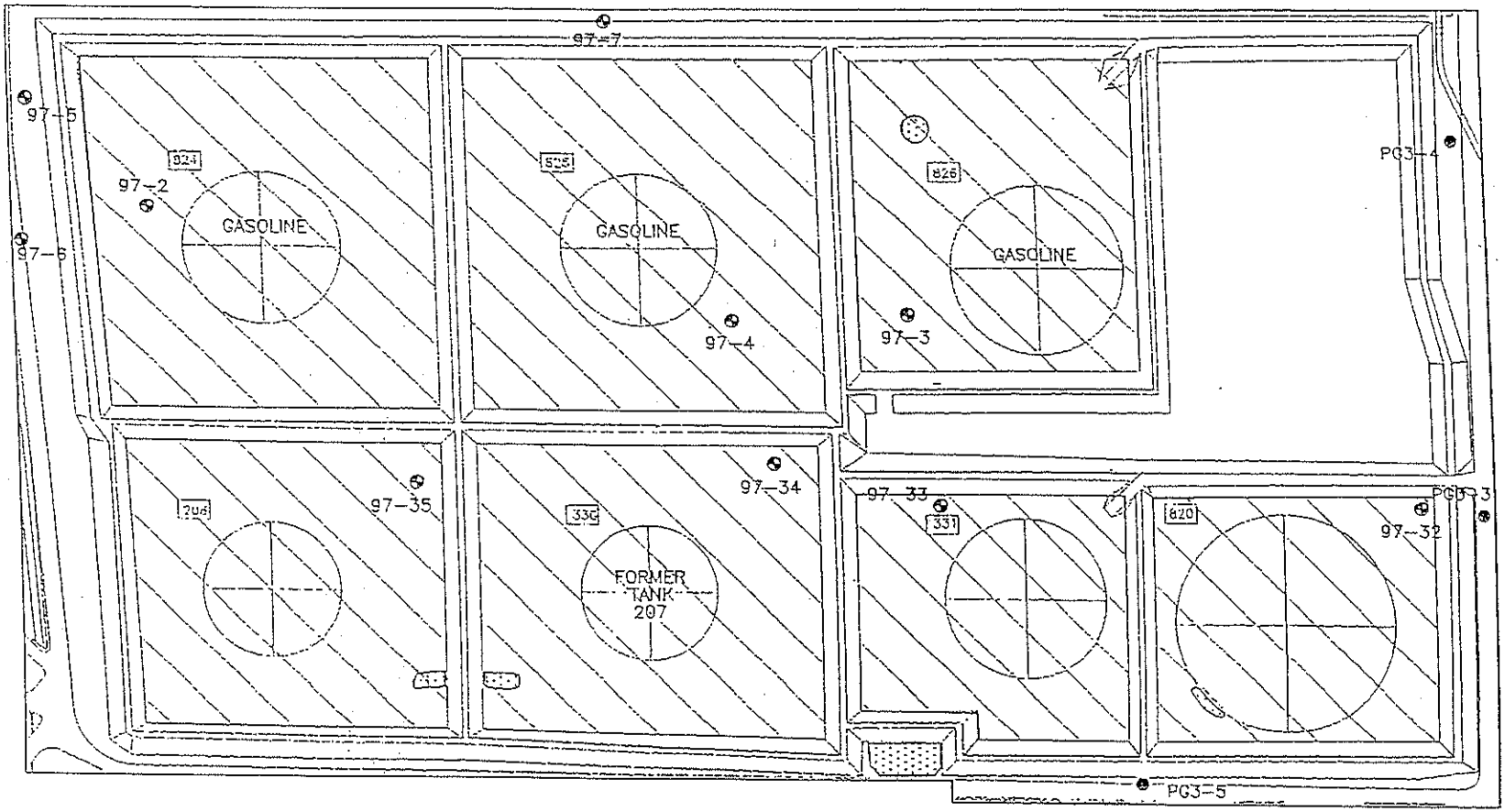
- 97-12 SOIL BORING LOCATION & NUMBER (1991,1997)
- AREA OF SOLID WASTE MANAGEMENT UNIT
- AREA OF HYDROCARBON STAINED SOIL

SCALE IN FEET

0 75 150 300

N

Attachment A, Sheet 7 of 13
SWMUs Location Map Requiring an RFI
pursuant to Compliance Plan Provision VIII
Crown Central Petroleum Corporation -
Pasadena
Compliance Plan No. CP-50112-000



LEGEND

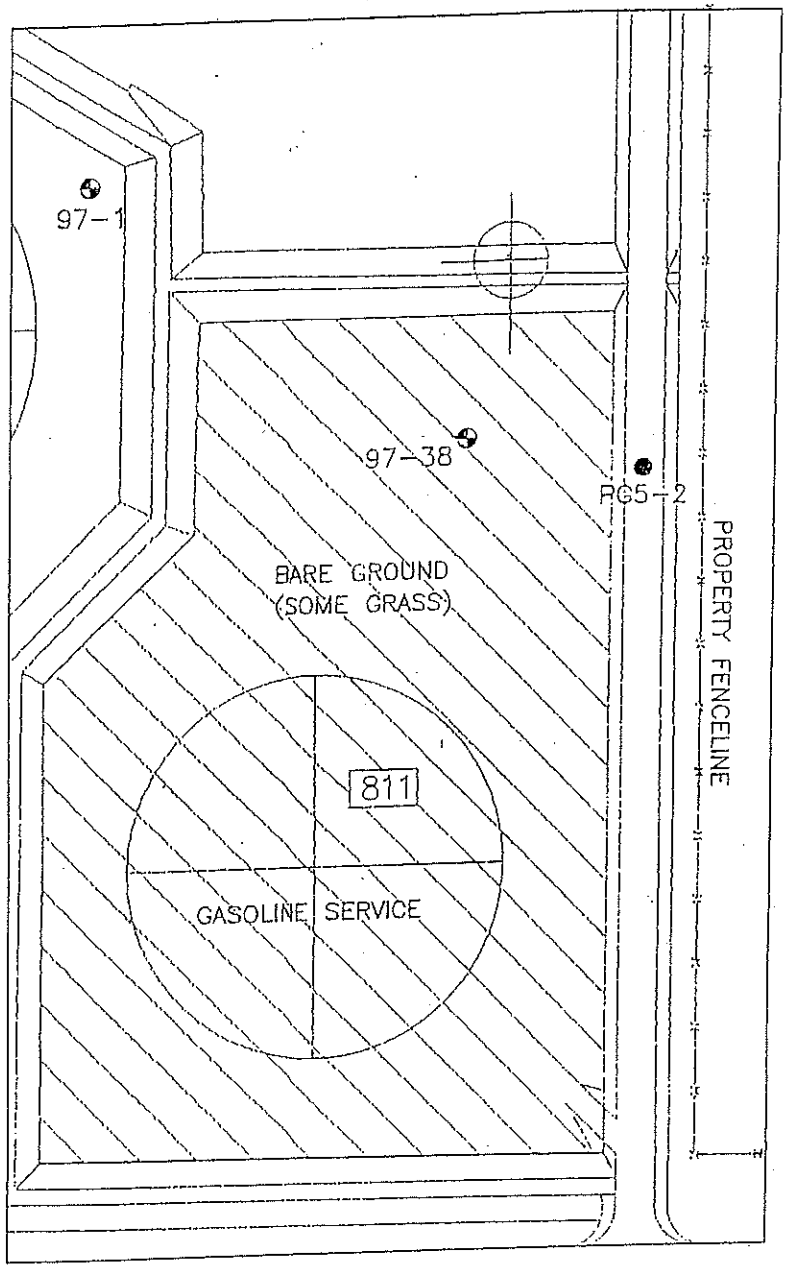
- ⊕ 97-12 SOIL BORING LOCATION & NUMBER (1991,1997)
- ● PG1-1 SOIL BORING LOCATION & NUMBER (1999)
- AREA OF SOLID WASTE MANAGEMENT UNIT
- AREA OF HYDROCARBON STAINED SOIL

SCALE IN FEET

0 10 20 40

N

Attachment A, Sheet 8 of 13
SWMUs Location Map Requiring an RFI pursuant to Compliance Plan Provision VIII
Crown Central Petroleum Corporation - Pasadena
Compliance Plan No. CP-50112-000



LEGEND

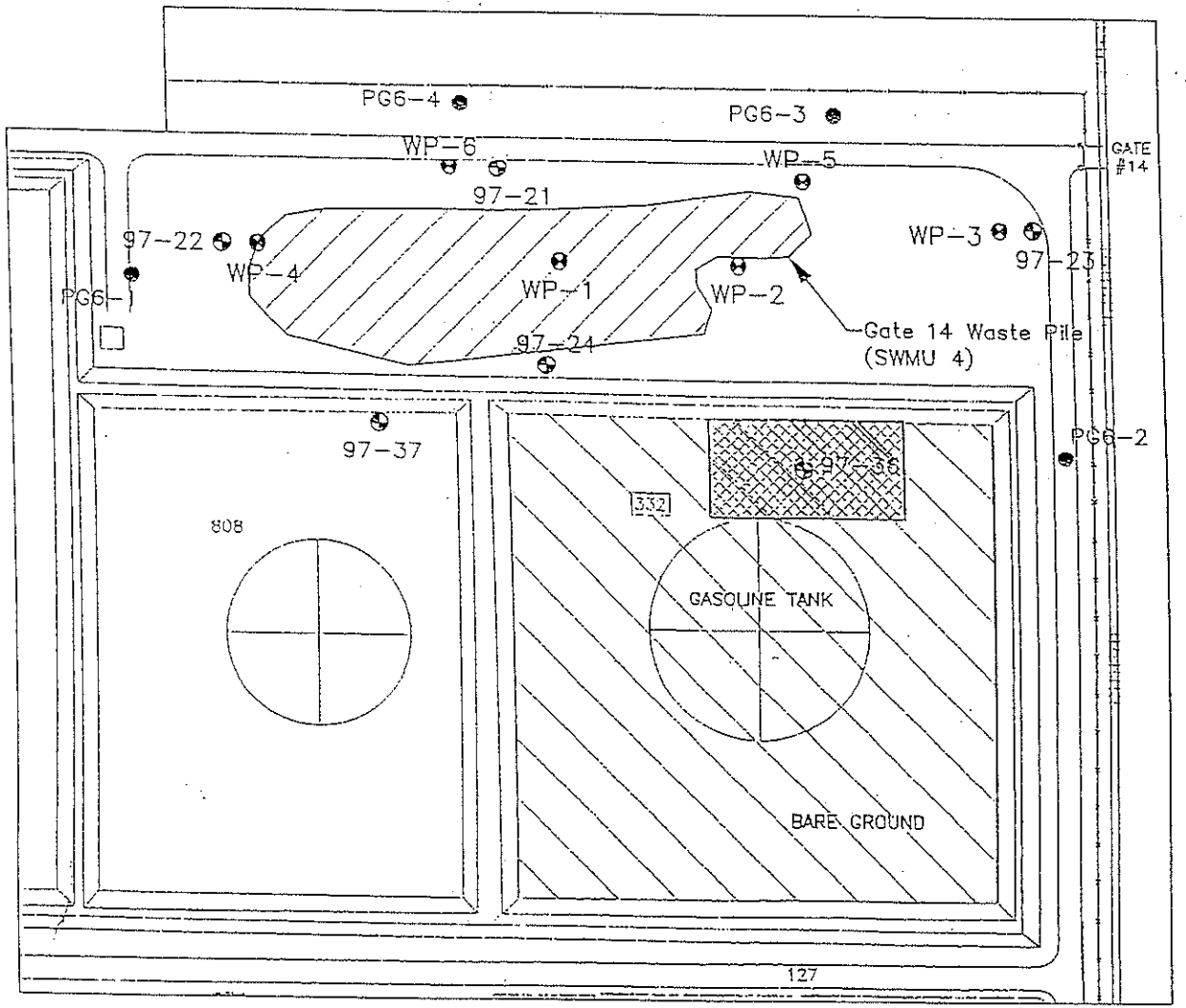
- 97-12 SOIL BORING LOCATION & NUMBER (1991,1997)
- PG1-1 SOIL BORING LOCATION & NUMBER (1999)
- AREA OF SOLID WASTE MANAGEMENT UNIT

SCALE IN FEET

0 75 150

N

Attachment A, Sheet 9 of 13
SWMUs Location Map Requiring an RFI pursuant to Compliance Plan Provision VIII
Crown Central Petroleum Corporation - Pasadena
Compliance Plan No. CP-50112-000



LEGEND

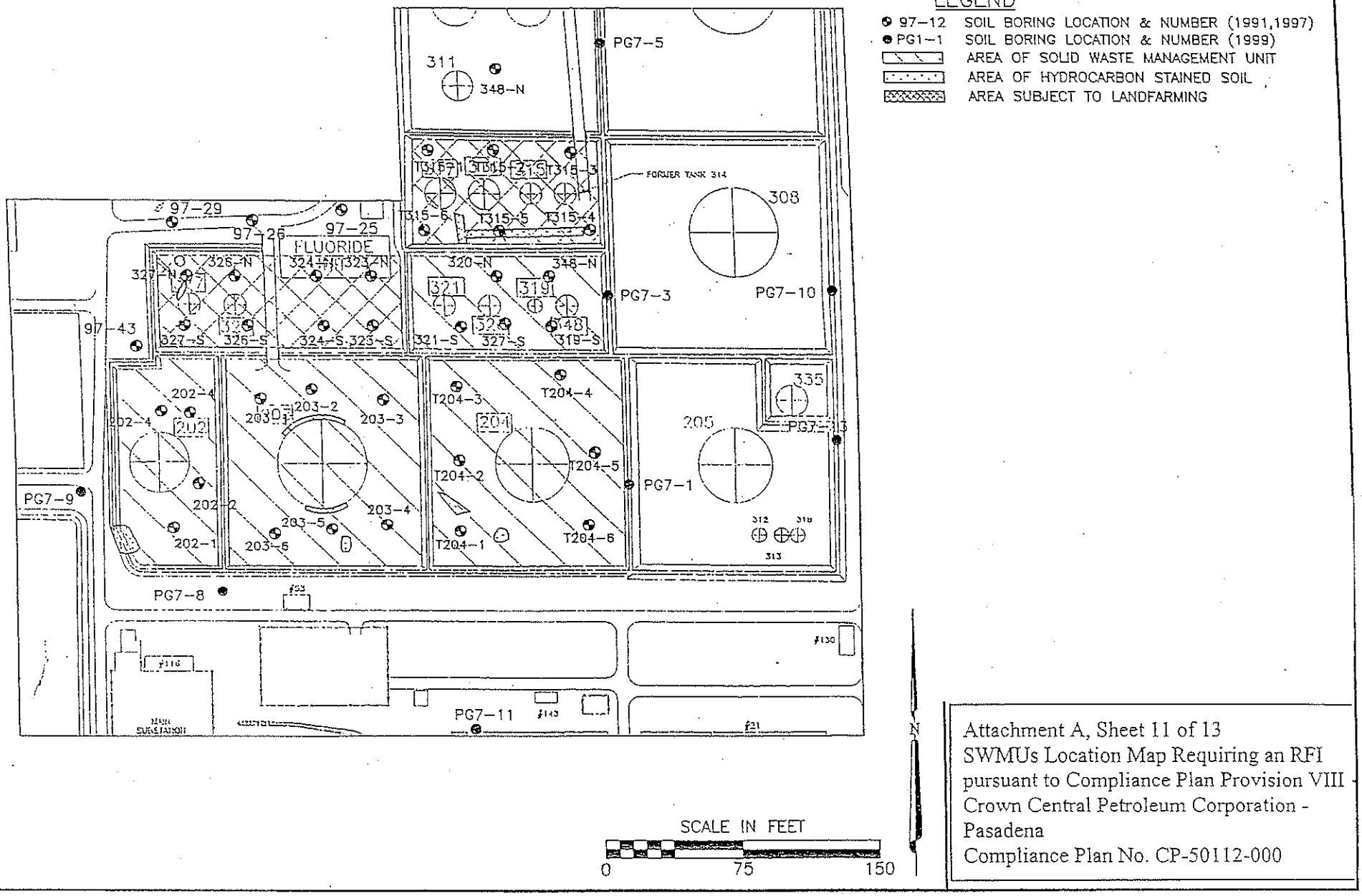
- 97-12 SOIL BORING LOCATION & NUMBER (1991,1997)
- DT-3 SOIL BORING LOCATION & NUMBER (1995)
- PG1-1 SOIL BORING LOCATION & NUMBER (1999)
- AREA OF SOLID WASTE MANAGEMENT UNIT
- AREA SUBJECT TO EXCAVATION

N

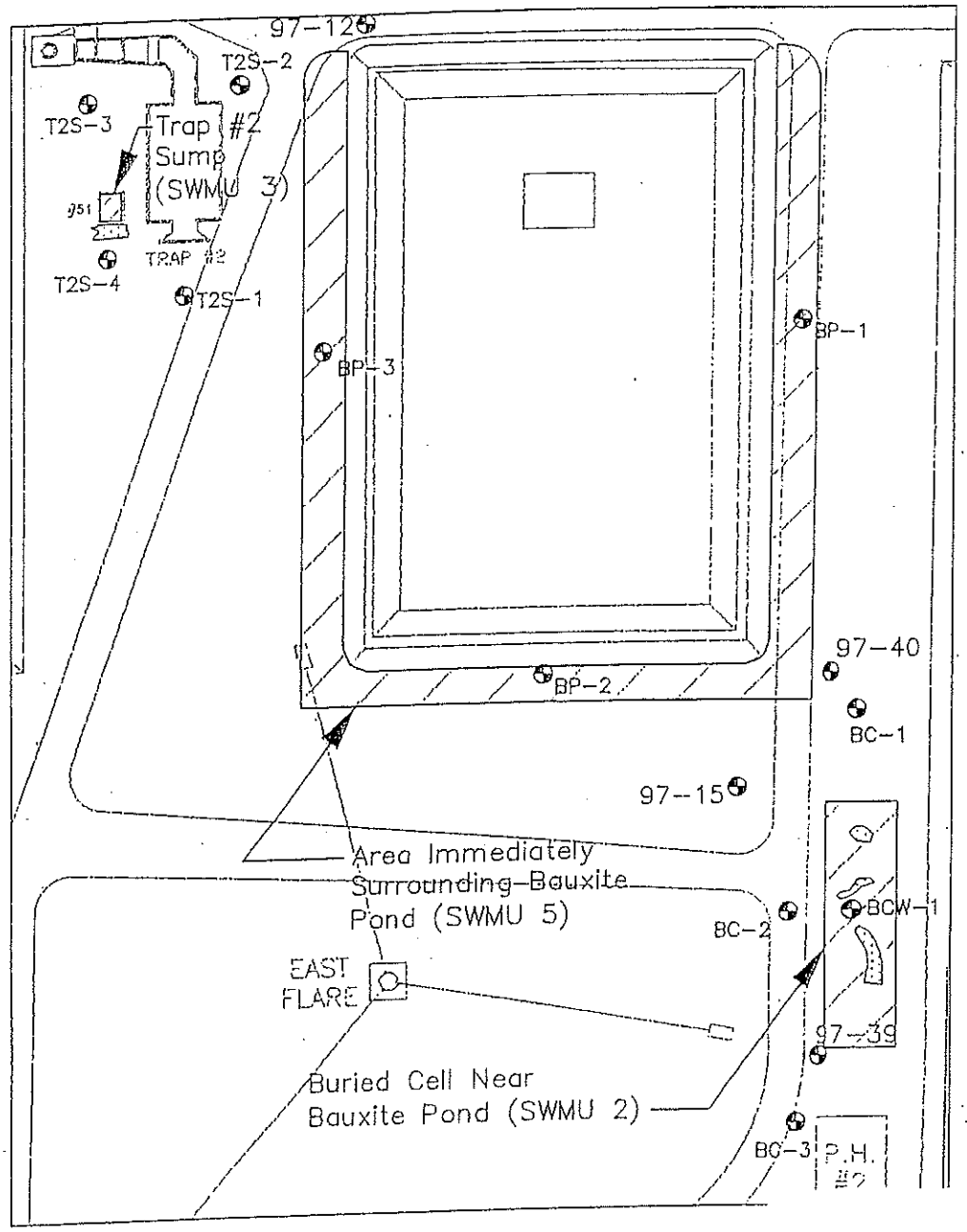
SCALE IN FEET

0 60 120 240

Attachment A, Sheet 10 of 13
SWMUs Location Map Requiring an RFI
pursuant to Compliance Plan Provision VIII
Crown Central Petroleum Corporation -
Pasadena
Compliance Plan No. CP-50112-000



Attachment A, Sheet 11 of 13
SWMUs Location Map Requiring an RFI pursuant to Compliance Plan Provision VIII
Crown Central Petroleum Corporation - Pasadena
Compliance Plan No. CP-50112-000



LEGEND

⊕ 97-12 SOIL BORING LOCATION & NUMBER (1991,1997)

AREA OF SOLID WASTE MANAGEMENT UNIT

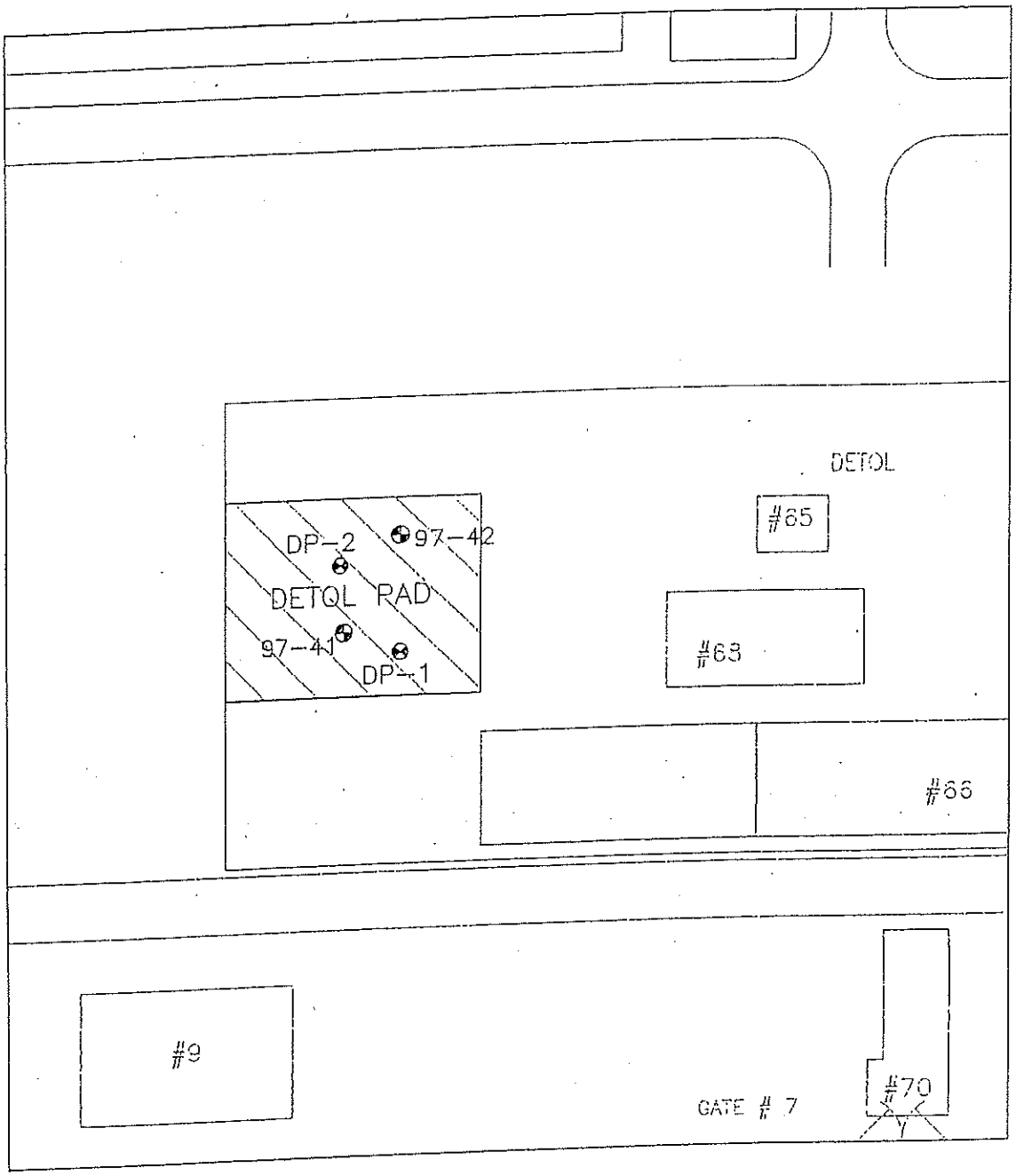
AREA OF HYDROCARBON STAINED SOIL

SCALE IN FEET

0 10 20 40

N

Attachment A, Sheet 12 of 13
SWMUs Location Map Requiring an RFI pursuant to Compliance Plan Provision VIII
Crown Central Petroleum Corporation - Pasadena
Compliance Plan No. CP-50112-000



LEGEND

- ⊕ 97-12 SOIL BORING LOCATION & NUMBER (1991,1997)
- ⊖ DT-3 SOIL BORING LOCATION & NUMBER (1995)
- AREA OF SOLID WASTE MANAGEMENT UNIT

SCALE IN FEET

0 45 90

N

Attachment A, Sheet 13 of 13
SWMUs Location Map Requiring an RFI
pursuant to Compliance Plan Provision VIII
Crown Central Petroleum Corporation -
Pasadena
Compliance Plan No. CP-50112-000

Attachment B - Well Design and Construction Specifications

1. The Permittee shall use well drilling methods that minimize potential adverse effects on the quality of water samples withdrawn from the well, and that minimize or eliminate the introduction of foreign fluids into the borehole.

2. All wells constructed to meet the terms of this Compliance Plan shall be constructed such that the wells can be routinely sampled with a pump, bailer, or alternate sampling device. Piping associated with recovery wells should be fitted with sample ports or an acceptable alternative sampling method to facilitate sampling of the recovered groundwater on a well by well basis.

3. Above the saturated zone the well casing may be two (2)-inch diameter or larger schedule 40 or 80 polyvinyl chloride (PVC) rigid pipe or stainless steel or polytetrafluoroethylene (PTFE or "teflon") or an approved alternate material. The PVC casing must bear the National Sanitation Foundation logo for potable water applications (NSF-pw). Solvent cementing compounds shall not be used to bond joints and all connections shall be flush-threaded. In and below the saturated zone, the well casing shall be stainless steel or PTFE.

   The Permittee may use PVC or fiberglass reinforced resin as an alternate well casing material in and below the saturated zone provided that it yields samples for groundwater quality analysis that are unaffected by the well casing material.

4. The Permittee shall replace any well that has deteriorated due to incompatibility of the casing material with the groundwater contaminants or due to any other factors. Replacement of the damaged well shall be completed within ninety (90) days of the date of the inspection that identified the deterioration.

5. Well casings and screens shall be steam cleaned prior to installation to remove all oils, greases, and waxes. Well casings and screens made of fluorocarbon resins shall be cleaned by detergent washing.

6. For wells constructed after the date of issuance of this Compliance Plan, the screen length shall not exceed ten (10) feet within a given transmissive zone unless otherwise approved by the executive director. Screen lengths exceeding ten (10) feet may be installed in groundwater recovery or injection wells to optimize the groundwater remediation process in accordance with standard engineering practice.

7. The Permittee shall design and construct the intake portion of a well so as to allow sufficient water flow into the well for sampling purposes and minimize the passage of formation materials into the well during pumping. The intake portion of a well shall consist of commercially manufactured stainless steel or PTFE screen or approved alternate material. The annular space between the screen and the borehole shall be filled with clean siliceous granular material (i.e., filter pack) that has a proper size gradation to provide mechanical retention of the formation sand and silt. The well screen slot size shall be compatible with the filter pack size as determined by sieve analysis data. The filter pack should extend no more than three (3) feet above the well screen. A silt trap, no greater than one (1) foot in length, may be added to the bottom of the well screen to collect any silt that may enter the well. The bottom of the well casing shall be capped with PTFE or stainless steel or approved alternate material.

Groundwater recovery and injection wells shall be designed in accordance with standard engineering practice to ensure adequate well production and accommodate ancillary equipment. Silt traps exceeding one (1) foot may be utilized to accommodate ancillary equipment. Well heads shall be fitted with mechanical well seals, or equivalent, to prevent entry of surface water or debris.

8. A minimum of two (2) feet of pellet or granular bentonite shall immediately overlie the filter pack in the annular space between the well casing and borehole. Where the saturated zone extends above the filter pack, pellet or granular bentonite shall be used to seal the annulus. The bentonite shall be allowed to settle and hydrate for a sufficient amount of time prior to placement of grout in the annular space. Above the minimum two (2)-foot thick bentonite seal, the annular space shall be sealed with a cement/bentonite grout mixture. The grout shall be placed in the annular space by means of a tremie pipe or pressure grouting methods equivalent to tremie grouting standards.

   The cement/bentonite grout mixture or TCEQ approved alternative grout mixture shall fill the annular space to within two (2) feet of the surface. A suitable amount of time shall be allowed for settling to occur. The annular space shall be sealed with concrete, blending into a cement apron at the surface that extends at least two (2) feet from the outer edge of the monitor well for above-ground completions. Alternative annular-space seal material may be proposed with justification and must be approved by the executive director prior to installation.

   In cases where flush-to-ground completions are unavoidable, a protective structure such as a utility vault or meter box should be installed around the well casing and the concrete pad design should prevent infiltration of water into the vault. In addition, the Permittee must ensure that 1) the well/cap juncture is watertight; 2) the bond between the cement surface seal and the protective structure is watertight; and 3) the protective structure with a steel lid or manhole cover has a rubber seal or gasket.

9. Water added as a drilling fluid to a well shall contain no bacteriological or chemical constituents that could interfere with the formation or with the chemical constituents being monitored. For groundwater recovery and injection wells, drilling fluids containing freshwater and treatment agents may be utilized in accordance with standard engineering practice to facilitate proper well installation. In these cases, the water and agents added should be chemically analyzed to evaluate their potential impact on in-situ water quality and to assess the potential for formation damage. All such additives shall be removed to the extent practicable during well development.

10. Upon completion of installation of a well, the well must be developed to remove any fluids used during well drilling and to remove fines from the formation to provide a particulate-free discharge to the extent achievable by accepted completion methods and by commercially available well screens. Development shall be accomplished by reversing flow direction, surging the well or by air lift procedures. No fluids other than formation water shall be added during development of a well unless the aquifer to be screened is a low-yielding water-bearing aquifer. In these cases, the water to be added should be chemically analyzed to evaluate its potential impact on in-situ water quality, and to assess the potential for formation damage.

    For recovery and injection wells, well development methods may be utilized in accordance with standard engineering practice to remove fines and maximize well efficiency and specific capacity. Addition of freshwater and treatment agents may be utilized during well development or re-development to remove drilling fluids, inorganic scale or bacterial slime. In these cases, the water and agents added should be chemically analyzed to evaluate their potential impact on in-situ water quality and to assess the potential for formation damage. All such additives shall be removed to the extent practicable during well development.

11. Each well shall be secured and/or designed to maintain the integrity of the well borehole and groundwater.

12. The Permittee shall protect the above-ground portion of the well by bumper guards and/or metal outer casing protection when wells are located in traffic areas or outside the secured plant area.

13. Copies of drilling and construction details demonstrating compliance with the items of this provision shall be kept on site. This record shall include the following information:

. name/number of well (well designation);
. intended use of the well(sampling, recovery, etc.);
. date/time of construction;
. drilling method and drilling fluid used;
. well location (± 0.5 ft.);
. bore hole diameter and well casing diameter;
. well depth (± 0.1 ft.);
. drilling and lithologic logs;
. depth to first saturated zone;
. casing materials;
. screen materials and design;
. casing and screen joint type;
. screen slot size/length;
. filter pack material/size;
. filter pack volume (how many bags, buckets, etc.);
. filter pack placement method;
. sealant materials;
. sealant volume (how many bags, buckets, etc.);
. sealant placement method;
. surface seal design/construction;
. well development procedure;
. type of protective well cap;
. ground surface elevation (± 0.01 ft. MSL);
. top of casing elevation (± 0.01 ft. MSL); and,
. detailed drawing of well (include dimensions).

14. The Permittee shall complete construction or plugging and abandonment of each well in accordance with the requirements of this Compliance Plan and 16 TAC Chapter 76 and shall certify such proper construction or plugging and abandonment in the first report submitted pursuant to Section VII.C.2. following installation or plugging and abandonment. Well completion logs for each newly installed or replaced well shall be included with the report. The certification shall be prepared by a qualified geologist or geotechnical engineer. Each well certification shall be accompanied by a certification report, including an accurate log of the soil boring, which thoroughly describes and depicts the location, elevations, material specifications, construction details, and soil conditions encountered in the boring for the well. A copy of the certification and certification report shall be kept on-site, and a second copy shall be submitted to the executive director. Required certification shall be in the following format, edited as appropriate:

"This is to certify that installation *(or plugging and abandonment)* of the following facility components authorized or required by TCEQ Compliance Plan No. 50112 has been completed, and that construction *(or plugging)* of said components has been performed in accordance with and in compliance with the design and construction specifications of Compliance Plan No. 50112:" *(Add description of facility components with reference to applicable Compliance Plan provisions).*

15. The Permittee shall clearly mark and maintain the well number on each well at the site.

16. The Permittee shall measure and keep a record of the elevation of the top of each well casing in feet above mean sea level to the nearest 0.01 foot and permanently mark the measuring point on the well. The Permittee shall compare old and new elevations from previously surveyed wells and determine a frequency of surveying not to exceed five (5) year intervals.

17. Wells may be replaced at any time the Permittee or executive director determines that the well integrity or materials of construction or well placement no longer enable the well to yield samples representative of groundwater quality.

18. The Permittee shall plug soil test borings and wells removed from service after issuance of the Compliance Plan with a cement/bentonite grout mixture so as to prevent the preferential migration of fluids in the area of the borehole. Certification of each plugging shall be reported in accordance with Provision 14 of Attachment B of this Compliance Plan. The plugging of wells shall be in accordance with 16 TAC Chapter 76 dealing with Well Drilling, Completion, Capping and Plugging.

19. A well's screened interval shall be appropriately designed and installed to meet the well's specific objective (i.e., either DNAPL, LNAPL, both, or other objective of the well). All wells designed to detect, monitor, or recover DNAPL must be drilled to intercept the bottom confining layer of the aquifer. The screened interval to detect DNAPL should extend from the top of the lower confining layer to above the portion of the aquifer saturated with DNAPL. The screened interval for all wells designed to detect, monitor, or recover LNAPL must extend high enough into the vadose zone to provide for fluctuations in the seasonal water table. In addition, the sandpacks for the recovery or monitoring well's screened interval shall be coarser than surrounding media to ensure the movement of NAPL to the well.